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Vol. 946 Number 2

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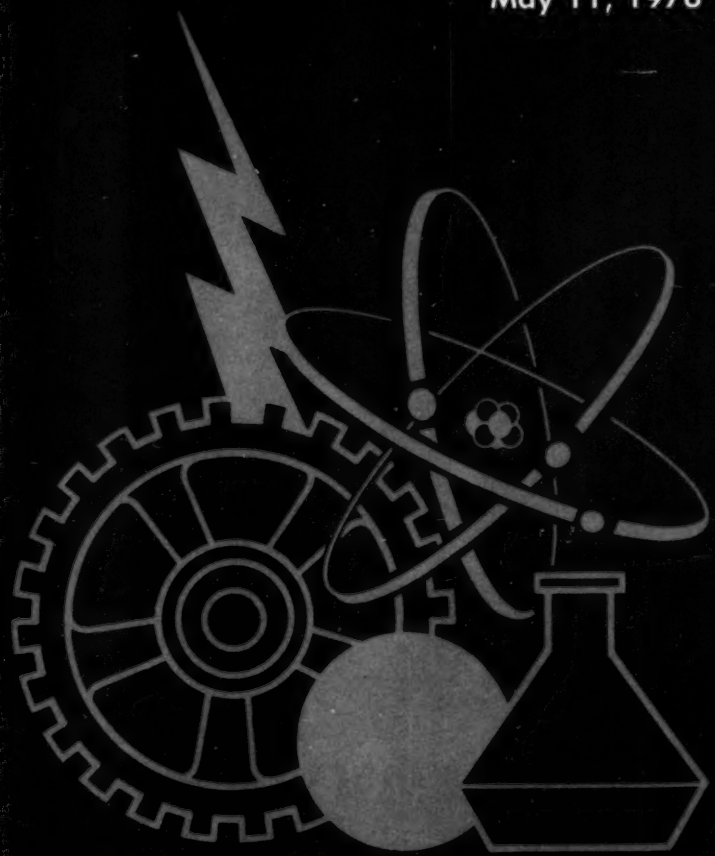
UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

May 11, 1976



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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

May 11, 1976 Volume 946 Number 2

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PATENT AND TRADEMARK OFFICE NOTICES

Board of Appeals Decisions Rendered in the Month of March 1976

Examiner affirmed	240
Examiner affirmed in part	39
Examiner reversed	108
Total	387

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,729,551, C. C. Cohn, SURFACE TREATMENT OF ALUMINUM AND ITS ALLOYS, **filed** Feb. 1, 1974, D.C. Del. (Wilmington) Doc. 74–22, *Colonial Alloys Company (a partnership of Samuel L. and Charles C. Cohn)* v. *Indian Head, Inc.* Stipulation dismissing this action with prejudice, Aug. 22, 1975.

3,047,040, T. A. O. Gross, PNEUMATIC LOAD BEARING DEVICES, **filed** Feb. 11, 1975, United States Court of Appeals for the First Circuit, Massachusetts (Boston) Doc. 75–1064, *Thomas A. O. Gross* v. *General Motors Corporation.* The judgment of the district court is affirmed, July 28, 1975.

3,056,719, D. R. Webster, CONTINUOUS WEB FORMING MACHINE, **filed** Mar. 19, 1975, D.C. Del. (Wilmington) Doc. 75–72, *David R. Webster and Aktiebolaget Karlstads Mekaniska Werkstad* v. *Beloit Corporation.*

3,167,491, Harrison and Jerrmann, POLYFLUORINATED ETHYLENE POLYMER-METAL ARTICLE AND METHOD, **filed** Jan. 23, 1976, D.C., S.D.N.Y., Doc. 76–C–394 JMC, *Polyflon Corporation* v. *Plated TFE Components, Inc. et al.*

3,180,744, Davies and Walther, REFRACTORY, **filed** July 30, 1975, D.C., M.D.N.C. (Greensboro) Doc. C–75–315–G, *Joseph F. Smith* v. *Burlington Industries, Inc.*

3,226,612, J. C. Haenichen, SEMICONDUCTOR DEVICE AND METHOD, **filed** Sept. 21, 1970, D.C., N.D. Ill. (Chicago) Doc. 70c2327, *Texas Instruments Incorporated* v. *Motorola, Inc.* Action dismissed, Sept. 11, 1972.

3,286,923, Jackson and Braucksiek, THERMOSTATIC CONTROL DEVICE FOR NORMAL AND ABNORMAL CONDITIONS, **filed** Oct. 31, 1975, D.C., W.D. Mich. (Grand Rapids) Doc. G75–527–Cal, *Robertshaw Controls Co.* v. *Bradford-White Corp.* Dismissal by plaintiff, Nov. 24, 1975.

3,474,553, G. E. Moore, Sr., FABRIC SPREADING AND FEEDING MACHINE, **filed** Nov. 18, 1974, D.C., S.D. Fla. (Fort Lauderdale) Doc. FL–74–373–C–WM, *R. L. Sjostrom Company* v. *Jensen Machinery, Inc.* Consent judgment, complaint and all counterclaims be dismissed with prejudice, Jan. 15, 1976. **Same, filed** July 1, 1975, D.C., S.D. Fla. (Fort Lauderdale) Doc. FL–75–304–C–JE, *Jensen Corporation* v. *R. L. Sjostrom Co.* Consent judgment, complaint and all counterclaims be dismissed with prejudice, Jan. 16, 1976.

3,484,771, M. S. Falck, Jr. ALARM SYSTEM; **3,772,667,** same, EVENT SIGNAL TRANSMITTER HAVING EVENT SIGNAL DISPLAYING MEANS, **filed** Dec. 17, 1974, D.C. Ore. (Portland) Doc. C–74–984, *Morse Products Mfg.* v. *Electronic Surveillance Corporation and Trionic Alarms Co., Inc.* Consent judgment and decree as to both defendants, as to Trionic Alarm Co. entered Aug. 5, 1975, as to Electronic Surveillance Corp., entered Jan. 8, 1976.

3,495,038, E. E. Clift, CRYPTOGRAPHIC SYSTEM, **filed** Jan. 23, 1976, D.C. Conn. (New Haven) Doc. N–76–37, *Eugene Emerson Clift* v. *United States of America.*

3,538,848, W. P. Barbour, LATCH MEANS FOR A TRAVELING ROLLER PLATEN ON A SWINGABLE CARRIAGE; **D. 217,398,** same, IMPRINTER, **filed** Feb. 1, 1973, D.C. Del. (Wilmington) Doc. 4572, *Control Data Corporation* v. *Farrington Business Machines Corporation.* Count I of the amended complaint is dismissed without prejudice; Count II of complaint dismissed with prejudice and defendant's counterclaim be dismissed with prejudice, Nov. 6, 1973.

3,545,154, Bobzin and Sawyer, SURFACE PANEL ASSEMBLY WITH RIGID STRIPS TO CONCEAL FASTENERS, **filed** Sept. 29, 1975, D.C., N.D. Ill. (Chicago) Doc. 75c3250, *The Celotex Corp.* v. *U.S. Gypsum Co.*

3,549,575, Payne and Chandler, JOINT SEALANT COMPOSITION, **filed** Dec. 2, 1975, D.C., W.D. Okla. (Oklahoma City), Doc. 75–1016–C, *Allied Materials Corporation* v. *Superior Products Company, Inc.*

3,552,495, J. R. Fiero, FIRE EXTINGUISHER, **filed** Feb. 12, 1975, D.C., C.D. Calif. (Los Angeles), Doc. CV 75–498–FW, *HTL Industries, Incorporated* v. *Textron, Incorporated et al.*

3,585,277, P. E. Lewis, MIDSPAN ELECTRICAL CONDUCTOR SPACER, **filed** Oct. 18, 1975, D.C., N.D. Ala. (Birmingham) Doc. CA–74–G–1097–S, *A. B. Chance Company* v. *Continental Electric Company.* Decree and final judgment, plaintiff is owner of said patent, and defendant is enjoined from further infringement of any claims of said patent, Sept. 30, 1975.

3,599,921, W. J. Cumber, INDEPENDENT SUPPORT CLIPS, **filed** May 25, 1972, D.C., N.D. Ohio (Cleveland) Doc. C72–549, *Erico Products, Inc.* v. *Faxtway Fastners, Inc.* Stipulation and order dismissing case with prejudice, Apr. 23, 1975.

3,772,667. (See 3,484,771.)

3,852,041, Moore, Haggart, Jr. and Foster, LOW PROFILE CATALYTIC CONVERTER, **filed** Jan. 26, 1976, D.C., S.D. Ohio (Dayton) Doc. C–3–76–28, *General Motors Corporation* v. *Toyota Motor Company, Ltd. et al.*

D. 217,398. (See 3,538,848.)

PATENT NOTICES

Certificates of Correction for the Week of May 11, 1976

P.P. 3,829	3,884,878	3,919,503	3,935,922
Re. 28,586	3,885,032	3,920,027	3,936,184
Re. 28,709	3,886,282	3,920,434	3,936,197
D. 238,771	3,887,342	3,920,979	3,936,255
D. 238,855	3,887,455	3,921,935	3,936,339
3,652,855	3,887,761	3,922,224	3,936,446
3,686,626	3,887,796	3,922,498	3,936,747
3,695,441	3,889,458	3,922,808	3,936,975
3,719,942	3,891,033	3,923,176	3,937,669
3,721,680	3,891,717	3,923,484	3,937,758
3,723,706	3,892,078	3,923,690	3,937,925
3,740,764	3,892,539	3,923,792	3,938,095
3,752,662	3,895,773	3,924,043	3,938,352
3,762,888	3,896,243	3,925,444	3,938,428
3,772,313	3,897,910	3,925,468	3,938,479
3,796,723	3,898,625	3,926,017	3,938,602
3,803,085	3,898,895	3,926,629	3,938,735
3,809,667	3,899,496	3,926,646	3,938,895
3,813,247	3,900,711	3,927,000	3,939,434
3,816,101	3,901,181	3,927,300	3,939,542
3,817,882	3,901,862	3,927,797	3,939,569
3,819,651	3,902,963	3,928,106	3,939,669
3,820,587	3,903,235	3,928,245	3,939,741
3,822,587	3,903,362	3,928,365	3,939,791
3,823,440	3,903,393	3,928,383	3,939,956
3,825,834	3,903,847	3,928,402	3,940,288
3,832,175	3,904,529	3,929,406	3,940,310
3,837,307	3,905,116	3,929,441	3,940,330
3,840,620	3,905,120	3,929,482	3,940,331
3,841,213	3,905,913	3,930,085	3,940,424
3,849,276	3,905,982	3,930,160	3,940,542
3,850,219	3,906,032	3,930,206	3,940,574
3,855,365	3,906,344	3,930,360	3,940,595
3,859,312	3,906,508	3,930,451	3,940,695
3,859,357	3,906,539	3,930,714	3,940,762
3,861,732	3,907,268	3,930,859	3,940,769
3,862,842	3,907,818	3,931,143	3,940,876
3,864,303	3,909,494	3,931,169	3,940,889
3,866,667	3,910,447	3,931,451	3,941,052
3,867,377	3,910,656	3,932,034	3,941,087
3,869,988	3,910,697	3,932,056	3,941,190
3,871,414	3,910,901	3,932,377	3,941,308
3,872,493	3,912,640	3,932,874	3,941,343
3,873,416	3,912,646	3,932,933	3,941,585
3,876,649	3,913,951	3,933,597	3,941,689
3,876,847	3,914,762	3,933,761	3,941,915
3,876,909	3,915,767	3,933,882	3,941,941
3,876,914	3,915,968	3,933,915	3,942,166
3,878,731	3,916,333	3,934,531	3,942,198
3,879,271	3,916,476	3,934,668	3,942,296
3,879,710	3,916,692	3,934,858	3,942,364
3,880,859	3,917,186	3,934,944	3,942,369
3,880,874	3,917,310	3,934,996	3,942,685
3,880,892	3,917,906	3,935,277	3,943,120
3,881,455	3,918,633	3,935,359	3,943,417
3,882,141	3,918,828	3,935,684	3,943,495
3,884,764	3,918,922	3,935,847	

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF APRIL 10, 1976

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds: Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-15-75
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur: Misc. Esters; Carbohydrates: Herbicides; Poisons; Medicines; Cosmetics; Sterolds; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	5-8-75
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	1-14-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	3-5-75
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	6-5-75
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures: Illumination: Horology; Acoustics; Recorders; Weighing Scales.	2-27-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	6-16-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	5-22-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	10-10-75
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	5-19-75
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	1-10-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	5-19-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	9-29-75
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	6-13-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	5-15-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	9-30-75

Expiration of patents: The patents within the range of numbers indicated below expire during April 1976, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,880,419 to 2,884,633 inclusive
Plant Patents..... Numbers 1,825 to 1,828 inclusive

REISSUES

MAY 11, 1976

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 28,805

LUBRICANTS CONTAINING AMINE ANTIOXIDANTS

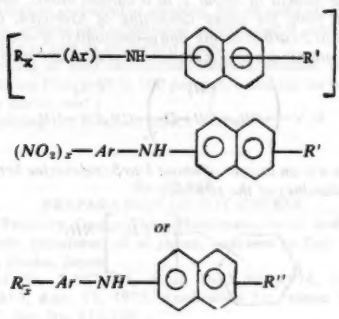
Milton Braid, Westmont, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Original No. 3,773,665, dated Nov. 20, 1973, Ser. No. 199,732, Nov. 17, 1971. Application for reissue Sept. 25, 1974, Ser. No. 508,934

Int. Cl.² C10M *1/34*

U.S. Cl. 252—50 **9 Claims**

1. A lubricant composition comprising a major proportion of a lubricant and an antioxidant amount of a mixture comprising p,p'-dioctyldiphenylamine and a substituted naphthylamine of [the formula] *one of the formulas*



wherein R is [NO_2 or] an alkyl of from 4 to 20 carbon atoms, Ar is phenyl or naphthyl, R' is hydrogen or phenylazo, [R' being hydrogen when R is nitro,] *R'' is phenylazo* and x is 1 or 2.

Re. 28,806

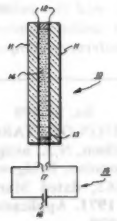
LIQUID CRYSTAL COMPOSITIONS

Franklin D. Saeva, and Richard L. Schank, both of Webster N.Y., assignors to Xerox Corporation, Stamford, Conn.

Original No. 3,819,531, dated June 25, 1974, Ser. No. 228,958, Feb. 24, 1972. Application for reissue June 3, 1975, Ser. No. 583,498

Int. Cl.² C09K *3/34*; G02F *1/13*

U.S. Cl. 252—299 **1 Claim**



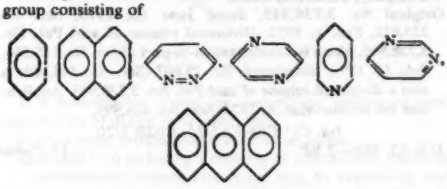
1. A liquid crystalline composition having the optical properties of the cholesteric liquid crystalline mesophase consisting essentially of: at least one nematic liquid crystalline material and at least one non-mesomorphic optically active material which is represented by the general formula selected from the group consisting of

$$W—Ar—Z, \textit{ and}$$
$$[W—Z, \text{ and}]$$
$$W—Ar—X=Y—Ar—Z$$

where X and Y are radicals chosen from the group consisting of

$$[X=CH_2, Y=NH]$$
$$[X=Y=CH_2]$$
$$X=Y=CH$$
$$X=CH, Y=N$$
$$X=Y=N$$
$$X=N, Y=N\rightarrow O$$
$$X=CH, Y=N\rightarrow O$$
$$[(X=Y)=C=C]$$

where W and Z can be the same or different and are chosen from the group consisting of NH_2 and alkenyl, alkynyl, alkoxy, alkyl, ester, carbonate and aldehyde radicals having up to and including nine carbon atoms, and where Ar is chosen from the group consisting of



Re. 28,807

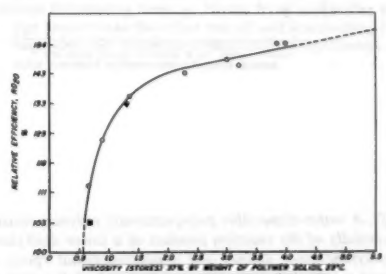
POLYQUATERNARY FLOCCULANTS

Hans Peter Panzer, Stamford, Conn., and Kenneth Wayne Dixon, Upsilanti, Mich., assignors to American Cyanamid Company, Stamford, Conn.

Original No. 3,738,945, dated June 12, 1973, Ser. No. 223,622, Feb. 4, 1972. Divisional reissue of said Pat. No. 3,738,945, which is a continuation-in-part of Ser. No. 115,556, Feb. 16, 1971, abandoned. Re. 28,808 (Ser. No. 448,599) is also a divisional reissue of said Pat. No. 3,738,945. Application for reissue Mar. 6, 1974, Ser. No. 448,600.

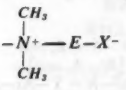
Int. Cl.² C08G *65/26*; C02B *1/20*

U.S. Cl. 260—2 BP **15 Claims**


RELATIVE EFFICIENCY, H2p
VISCOSITY (STOKES) X1%, BY WEIGHT OF POLYMER SOLIDS, 25°C
(BASED ON WEIGHT OF CATIONIC PORTION OF POLYMER)

21. *A water-dispersible polyquaternary polymer of essentially linear structure consisting essentially of the*

difunctional reaction product of dimethylamine and a difunctional epoxy compound selected from the group consisting of epihalohydrins and precursors for epihalohydrins which under alkaline conditions are readily converted into the corresponding epoxy compounds, and mixtures thereof, said polyquaternary polymer containing repeating units of



wherein E is a residue obtained from said epoxy compound; the total amounts of reactants being substantially equimolar, the combination of which is such as to provide a polyquaternary compound which as a 37% aqueous solution, by weight, based on the cationic portion of said polyquaternary compound has a viscosity at 25°C. of at least 100 centistokes; and X^- represents an ion forming the anionic portion of said polyquaternary.

Re. 28,808

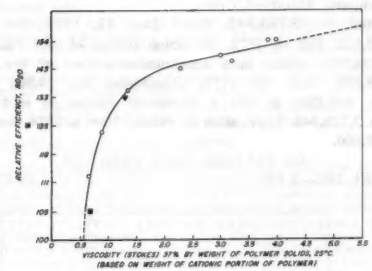
POLYQUATERNARY FLOCCULANTS

Hans Peter Panzer, Stamford, Conn., and Kenneth Wayne Dixon, Upsilante, Mich., assignors to American Cyanamid Company, Stamford, Conn.

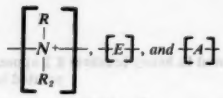
Original No. 3,738,945, dated June 12, 1973, Ser. No. 223,622, Feb. 4, 1972. Divisional reissue of said Pat. No. 3,738,945, which is a continuation-in-part of Ser. No. 115,556, Feb. 16, 1971, abandoned. Re. 28,807 (Ser. No. 448,600) is also a divisional reissue of said Pat. No. 3,738,945. Application for reissue Mar. 6, 1974, Ser. No. 448,599.

Int. Cl.² C08G *65/26*; C02B *1/20*

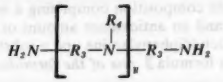
U.S. Cl. 260—2 BP **19 Claims**


RELATIVE EFFICIENCY, Ri/Ro
VISCOSITY (STOKES) 37% BY WEIGHT OF POLYMER SOLIDS, 25°C.
(BASED ON WEIGHT OF CATIONIC PORTION OF POLYMER)

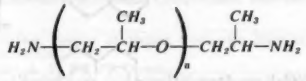
27. *A water-dispersible polyquaternary polymer consisting essentially of the reaction product of a lower dialkylamine, a polyfunctional amine, and a polyfunctional epoxy compound selected from the group consisting of diepoxides and precursors of diepoxides which under alkaline conditions are readily converted into the corresponding epoxy compounds, and mixtures thereof, said polyquaternary polymer containing repeating units of the structures*



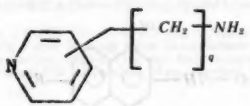
as the cationic portion, and X^- as the anionic portion wherein R and R_2 are individually selected from the group consisting of alkyls of 1 to 3 carbon atoms; E is a residue obtained from said epoxy compound; A is a residue obtained after at least bifunctional epoxy reaction from a polyfunctional amine selected from the group consisting of ammonia; primary amines; alkylenediamines of 2 to 6 carbon atoms; polyalkylenepolyamines of the structure



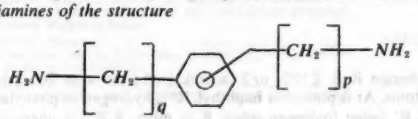
wherein y represents an integer of about 1 to 5, R_3 is an alkylene radical of about 2 to 6 carbon atoms, and R_4 is selected from the group consisting of hydrogen, alkyl of about 1 to 3 carbon atoms, and ω-aminoalkyl of about 2 to 6 carbon atoms; a polyglycolamine of a structure such as:



wherein a is an integer of about 1 to 5; piperazine heteroaromatic diamines of the structure



wherein q is zero or an integer of about 1 to 3; and aromatic diamines of the structure



wherein p and q are individually zero or an integer of about 1 to 3; X^- is an anion forming the anionic portion of said polyquaternary compound; the amount of said polyfunctional amine being up to about 15 mole percent of the total moles of said dialkylamine and said polyfunctional amine, the amount of said E is from at least that amount which is substantially equimolar to the molar quantities of said amines up to the full functional equivalency of said amines, so as to provide a polyquaternary compound which as a 37% aqueous solution based on the cationic portion of said polyquaternary compound has a viscosity at 25°C. of at least 100 centistokes; and the amount of said ion present is such as to satisfy anion requirements of the cationic portion of said polyquaternary compound.

Re. 28,809

PREPARATION OF STARCH ESTERS

Martin M. Tessler, Edison, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

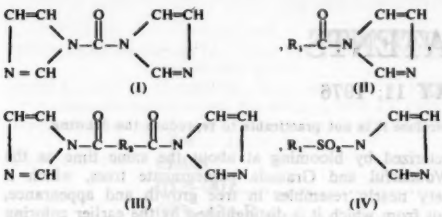
Original No. 3,720,663, dated Mar. 13, 1973, Ser. No. 156,524, June 24, 1971. Application for reissue Jan. 22, 1975, Ser. No. 542,929

Int. Cl.² C08B *31/02*

U.S. Cl. 260—233.5 **9 Claims**

1. A process for preparing esters of a starch having free reactive hydroxyl groups comprising the steps of:

a. reacting said starch with an [imidazolide-acid reaction product] *imidazolide of carboxylic or sulfonic acid* selected from the [group] *groups* consisting of



(I) (II)

(III) (IV)

and triimidazolides of tricarboxylic acids,

wherein R_1 is selected from the group consisting of alkyl, substituted alkyl, unsaturated alkyl, cycloalkyl, aryl, substituted aryl and arylalkyl, R_2 is selected from the group consisting of alkylene, substituted alkylene, bis-alkylene ether, cycloalkylene, arylene and substituted arylene; and R_1 and R_2 each contain from one to 20 carbon atoms;

the amount of said imidazolide reagent reacted with said starch being from 0.05 to 100 percent, based on the weight of the dry starch; and

b. isolating the resultant starch derivative.

Re. 28,810

PREPARATION OF SOY CHEESE

Haruo Tsumura, Osaka; Yukio Hashimoto, Izumi, and Hayata Kubota, Izumiotsu, all of Japan, assignors to Fuji Oil Co., Ltd., Osaka, Japan

Original No. 3,857,970, dated Dec. 31, 1974, Ser. No. 351,813, Apr. 17, 1973. Application for reissue Sept. 8, 1975, Ser. No. 611,186

Claims priority, application Japan, Apr. 17, 1972, 47-38421; Apr. 20, 1972, 47-39852

Int. Cl.² A23C *19/02*

U.S. Cl. 426—46 **11 Claims**

1. A process for making a cheese-like food from soy milk comprising

preparing an emulsion containing soy milk and an edible fat in sufficient amounts to form an oil-in-water emulsion;

inoculating said emulsion with a lactic acid-forming cheese starter culture and incubating the inoculated emulsion to form a fermented broth;

adding to said fermented broth a coagulant selected from the group consisting of aldonic acid lactones, uronic acid lactones and mixtures thereof;

heating the resultant mixture to a temperature within the range of about 40° to 70° C. and maintaining the mixture at said temperature for a time sufficient to form a curd therefrom;

separating whey from said curd;

cooking said curd; and

aging said cooked curd.

Re. 28,811

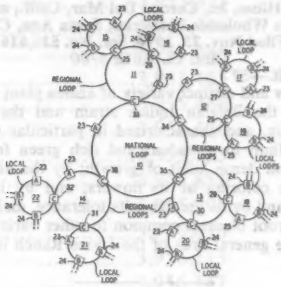
INTERCONNECTED LOOP DATA BLOCK TRANSMISSION SYSTEM

John Robinson Pierce, Pasadena, Calif., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Original No. 3,731,002, dated May 1, 1973, Ser. No. 79,185, Oct. 8, 1970. Application for reissue Oct. 29, 1973, Ser. No. 410,813

Int. Cl.² H04J *6/02*

U.S. Cl. 179—15 AL **14 Claims**



1. A transmission system for transmitting multi-word message blocks of digital data comprising

at least three intersecting transmission loops,

each said loop including a plurality of substantially identical autonomous stations responsive only to availability and destination control signals indicating the availability and destination of said message blocks, respectively, said control signals being placed on said loop by any of said autonomous stations for respectively writing message blocks onto and for reading message blocks from that loop, and

a message block switching station at each intersection of said loops, said switching stations each comprising

buffer storage means for storing a plurality of said message blocks,

selection means responsive only to said destination control signals for selecting message blocks to be transferred to an intersecting loop,

means for writing the selected message blocks from one of said selected loops into said buffer storage means at the time of arrival thereof, and

means for reading message blocks from said buffer storage means onto the other one of said intersecting message loops in response to said availability control signals on said other one of said loops.

PLANT PATENTS

GRANTED MAY 11, 1976

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,881
AZALEA PLANT
James W. Hines, Jr., Corona Del Mar, Calif., assignor to Hines Wholesale Nurseries, Santa Ana, Calif.
Filed Nov. 25, 1974, Ser. No. 526,616
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—57 **1 Claim**

1. A new and distinct variety of azalea plant which is a hybrid of the Belgian Indica strain and the Southern Indica strain, and characterized in particular to novelty by its medium to abundant and rich green foliage and compact and dense habit of growth; by the unique fluorescent-like coloring of its flowers; and by its profuse flowering; and by its greater salts tolerance, making it less subject to root diseases common to other varieties grown in the same general area of the Irvine Ranch in southern California.

3,882
APPLE TREE-STARKSPUR PRIME RED
Calvin L. Cooper, Brewster, Wash., assignor to Stark Brothers Nurseries & Orchards Co., Louisiana, Mo.
Filed Dec. 24, 1974, Ser. No. 536,198
Int. Cl. A01h *5/03*

U.S. Cl. Plt.—35 **1 Claim**

1. A new and distinct variety of apple tree, substantially as herein shown and described, characterized particularly as to novelty, by its similarity of fruit to Topred Delicious (P.P. No. 1,916), but distinguished therefrom by its much smaller growth and more compact form, and with many more fruit spurs.

3,883
POMEGRANATE TREE
R. J. Owen, 24081 Johns Drive, Porterville, Calif. 93257
Filed Jan. 21, 1975, Ser. No. 542,847
Int. Cl. A01h *5/03*

U.S. Cl. Plt.—33 **1 Claim**

1. A new and distinct variety of pomegranate tree substantially as illustrated and described and which is characterized by blooming at about the same time as the Wonderful and Granada pomegranate trees, which it very nearly resembles in tree growth and appearance, but from which it is distinguished by the earlier coloring of its fruit, the later maturing of the fruit as compared to the Wonderful and the later maturity of its fruit as compared to the Granada.

3,884
POMEGRANATE TREE
R. J. Owen, 24081 Johns Drive, Porterville, Calif. 93257
Filed Jan. 21, 1975, Ser. No. 542,848
Int. Cl. A01h *5/03*

U.S. Cl. Plt.—33 **1 Claim**

1. A new and distinct variety of pomegranate tree substantially as illustrated and described and which is characterized by blooming at about the same time as the Wonderful and Granada pomegranate trees, which it very nearly resembles in tree growth and appearance, but from which it is distinguished by the earlier coloring of its fruit, the earlier maturing of the fruit as compared to the Wonderful and the later maturity of its fruit as compared to the Granada.

3,885
LILAC PLANT
Walter E. Lammerts, Corralitos, Calif., assignor to Hines Wholesale Nurseries, Santa Ana, Calif.
Filed Mar. 24, 1975, Ser. No. 561,327
Int. Cl. AO1H *5/00*

U.S. Cl. Plt.—66 **1 Claim**

1. A new and distinct variety of lilac plant, substantially as herein shown and described, characterized particularly as to novelty by its relatively short and mild winter-chilling requirements, by its regular and abundant production of large flower clusters consisting of large individual florets, by its vigorous habit of plant growth, and by its abundant production of large and attractive foliage.

PATENTS

GRANTED MAY 11, 1976

ERRATA

For CLASS	See PATENT NO.
052–001	3,955,323
073–421 R	3,955,436
082–001 C	3,955,448
084–411 R	3,955,465
084–470	3,955,466
273–153 R	3,955,630
123–117 R	3,955,723
214–017 R	3,955,851
096–129	3,955,996
264–014	3,956,076
260–112 R	3,956,113
423–019	3,956,147
526–338	3,956,246
526–042	3,956,247
526–219	3,956,248
526–500	3,956,249
526–194	3,956,250
526–073	3,956,251
526–074	3,956,252
526–352	3,956,253
526–352	3,956,254
526–352	3,956,255
526–064	3,956,256
526–064	3,956,257
307–297	3,956,661
323–044 F	3,956,690
324–029.5	3,956,720

PATENTS

GRANTED MAY 11, 1976

GENERAL AND MECHANICAL

3,955,217

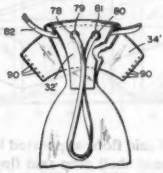
PERMANENTLY KNOTTED NECKTIE AND METHOD OF MAKING SAME

David H. Levy, 65-11 108th St., Forest Hills, N.Y. 11375

Continuation-in-part of Ser. No. 297,248, Nov. 13, 1972, abandoned. This application Feb. 26, 1973, Ser. No. 335,506

Int. Cl.² A41D *25/02*

U.S. Cl. 2—150 **8 Claims**



1. A permanently knotted necktie comprising: an elongated planar body portion having a front face visible during wearing of the necktie, a rear face not visible during wearing of the necktie, and two ends; a knot portion connected to one of said ends of said body portion comprising a strip encircling once said one end to define therewith a permanent necktie knot, one end of said body portion has an end flap folded back upon itself to define a folded-back portion; and wherein said single strip of said knot portion encircles said folded-back portion to define therewith said permanent necktie knot, said end flap being provided with a pair of spaced holes having fastening means and wherein said fastening means is a strap of flexible material extending through said holes in frictional engagement therewith and extending between the folds of said folded back portion, said strap having a loop portion and two free ends; and a one hand operated connector assembly connected to said two free ends for quickly, releasably connecting same together, said strap being adapted to extend resiliently around the neck of the user and being adjustable by sliding said strap through said holes, and connecting means connecting together the ends of said strip at the rear face of said body portion; and fastening means connected to said knot portion for quickly and detachably fastening the necktie during use around the neck of a wearer.

3,955,218

SELF-VENTING TANK VALVE FOR TOILET TANKS

Jerrold Craig Ramsey, 2820 Airport Road, Colorado Springs, Colo. 80910

Filed Apr. 7, 1975, Ser. No. 565,954

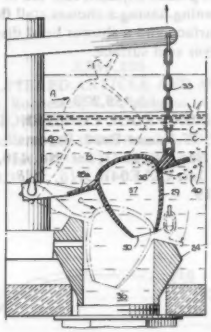
Int. Cl.² E03D *1/34*

U.S. Cl. 4—56 **9 Claims**

1. A tank valve for use in a tank-type toilet having an exit port at the bottom thereof and a valve seat having an opening therein for connecting the interior of the tank to the exit port, said valve comprising:

a closed upper portion adapted to extend across the opening of the valve seat with a predetermined surface area on said upper portion adapted to face said valve seat for closing the opening in the valve seat when engaged therewith; and

a lower portion extending downwardly from adjacent the predetermined surface area of the closed upper portion and adapted to extend within the opening of the valve seat, said lower portion having a cavity therein and a downwardly facing opening adjacent the bottom of the lower portion of the valve in communication with the cavity, the cavity when substantially filled with air providing a buoyancy force to the valve when said valve is opened with respect to the valve seat sufficient to delay the descent of the valve until water is substantially emptied from the tank; said lower portion having a vent hole extending from the outer surface thereof to the cavity therein and adapted to vent air outwardly from the cavity, the position of the vent hole at the outer surface of the



lower portion being below the predetermined surface area of the closed upper portion and at a predetermined distance above said opening in the lower portion and enabling sufficient water to enter the cavity as air is vented therefrom to reduce the buoyancy of the valve such that the valve will descend and close the opening in the valve seat before the water in the tank has emptied.

3,955,219

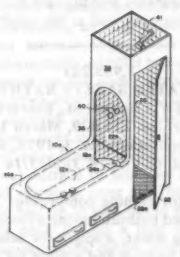
ELEVATED SAFETY BATHTUB AND SHOWER

Eve B. Finch, and Shelia A. Finch, both of 5190 SW. Chestnut St., Beaverton, Oreg. 97005

Division of Ser. No. 230,639, March 1, 1972, Pat. No. 3,864,762. This application July 12, 1974, Ser. No. 488,079

Int. Cl.² A47K *3/00, 3/03*

U.S. Cl. 4—148 **1 Claim**



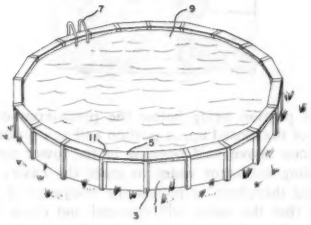
1. A safety bathtub and shower which comprises:

a. a tub having a floor and a surrounding wall for holding a quantity of water;

b. a surface adjacent to and exterior of said tub for a person to stand upon;

c. means for supporting said tub floor at substantially chair height above said surface;
d. said tub wall having an opening therein located above said surface and extending from the top of said wall downwardly toward said tub floor for permitting a person to seat himself on said tub floor through said opening with his feet on said surface preparatory to positioning himself wholly within said tub for bathing;
e. water-tight barrier means associated with said opening for sealingly closing said opening after said person has positioned himself wholly within said tub;
f. drain means disposed within said surface for collecting any water which may flow out of said tub through said opening; and
g. a shower stall placed adjacent said tub in communication with said opening having a shower stall floor which comprises said surface and a shower head disposed vertically above and over said surface.

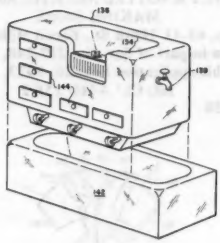
3,955,220
SWIMMING POOL CONSTRUCTION
Frank L. Kessler, 17 Vassar Road, Broomall, Pa. 19008
Filed Nov. 26, 1973, Ser. No. 418,917
Int. Cl.² E04H *3/16, 3/18*
U.S. Cl. 4—172.19 **4 Claims**



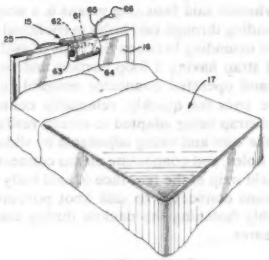
1. In an above ground swimming pool having a substantially continuous wall forming an enclosure and a flexible lining for said wall having an upper edge bead,
removable liner securing means within the enclosure having a wall member one end of which is looped over the upper edge of the swimming pool wall and extending thereabout,
the other end of said securing means being bent upwardly to form with the wall member thereof a channel opening upwardly and parallel to the swimming pool wall for receiving the edge head of said liner,
and means for releasably locking said liner securing means to said swimming pool wall at the upper end thereof.

3,955,221
ELEVATED SAFETY BATHTUB
Eve B. Finch, 5190 SW. Chestnut St., Beaverton, Oreg. 97005
Continuation of Ser. No. 230,639, March 1, 1972, Pat. No. 3,864,762. This application Jan. 3, 1975, Ser. No. 538,341
Int. Cl.² A47K *3/00, 3/14*
U.S. Cl. 4—173 R **10 Claims**

1. An apparatus for bathing comprising
a. a floor-supported bathtub having a floor and surrounding wall for holding water, a spigot for selectively admitting water into said bathtub and a drain for conducting water from said bathtub; and
b. bathtub shell means mounted atop said floor-supported bathtub and having a floor and surrounding wall forming a container for holding water independently of said floor-supported bathtub, said shell being of sufficient dimension to contain a person for bathing and being vertically supported by said surrounding wall of said floor-supported bathtub such that the floor of said shell is at a height substantially no lower than the top of said surrounding wall of said floor supported bathtub, said bathtub shell including support means engaging said surrounding wall of said floor-supported bathtub for detachably mounting said shell atop said floor-supported bathtub and resisting relative horizontal movement between said shell and said bathtub.



3,955,222
EASY RISE BED VIBRATOR DEVICE
Raymond J. Pater, 522 Archer Ave., McKeespor:, Pa. 15132
Filed Jan. 3, 1975, Ser. No. 538,339
Int. Cl.² A47D *9/02*
U.S. Cl. 5—109 **1 Claim**

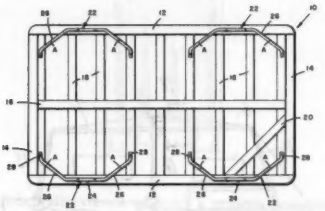


1. An easy rise bed vibrator device intended for mounting on a bed having side rails supporting a mattress thereon, the vibrator device comprising, in combination, an electric motor adapted to be mounted on one of the side rails of the bed on the inner side thereof facing the other side rail, bearing means adapted to be mounted on the opposite side rail of the bed in alignment with a shaft of said motor, an eccentric shaft having one end affixed to said motor shaft and having its opposite end rotatably mounted in said bearing means, said eccentric shaft comprising a series of axially aligned and longitudinally elongated rod members each interconnected by radially outwardly extending asymmetrical eccentric members disposed at longitudinal spaced apart positions therealong, a clock mechanism adapted to be mounted on a portion of said bed within easy reach of an individual resting in said bed for selective control of said motor, suitably insulated wire means interconnecting said motor and said clock mechanism, and suitably insulated electric wires having one end connected to said clock mechanism with their opposite ends terminating in a conventional standard electric plug adapted to be plugged into a conventional source of household electricity.

3,955,223
FURNITURE HAVING A BOX SPRING OR LIKE STRUCTURE AND SUPPORTING LEG MEMBERS THEREFOR

Ronald D. Minzey, Elkhart, Ind., assignor to Congoleum Industries, Inc., Kearny, N.J.

Filed May 8, 1975, Ser. No. 575,890
Int. Cl.² A47C *19/00*
U.S. Cl. 5—310 **10 Claims**

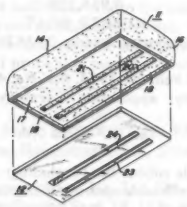


1. In a piece of furniture, a box spring or like structure comprising a substantially rectangular frame including longitudinally-extending side frame members and transversely-extending end frame members, and a plurality of supporting leg members secured to said box spring or like structure and supporting the same substantially horizontally at a predetermined distance above a floor or other supporting surface, each of said supporting leg members comprising an elongated structural member formed into a generally W-shaped configuraton wherein (1) a central portion is secured to said longitudinally-extending side frame member, (2) V-shaped portions adjacent to each side of said central portion extend angularly inwardly of the longitudinally-extending side frame members and downwardly to support said box spring or like structure substantially horizontally at a predetermined distance above a floor or other supporting surface, and (3) end portions extend inwardly of said longitudinally-extending side frame members to be secured to said box spring or like structure inwardly of said longitudinally-extending side frame members.

3,955,224
SEAT CONSTRUCTION

Milton H. Kramer, Wyncote, Pa., assignor to D S C Industries, Inc., Philadelphia, Pa.

Filed Mar. 5, 1975, Ser. No. 555,544
Int. Cl.² A47C *23/00*
U.S. Cl. 5—347 **17 Claims**

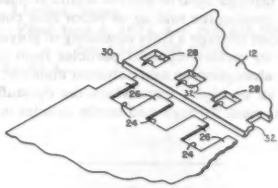


1. A cushioned seat structure comprising in combination,
a. a resiliently compressible foam cushion having top, bottom, front, rear and side faces, and at least one cavity opening through the bottom face of said cushion and extending upward therefrom for a distance into the body of said cushion but terminating short of said top face, said at least one cavity extending widthwise of said cushion along a line substantially parallel to the said cushion front face and spaced farther therefrom than from the said cushion rear face, and
b. an underlying cushion support platform having upper and lower surfaces with said cushion bottom face being seated flatwise upon said support platform upper surface, and at least one aperture completely through said support platform from the said upper surface to the said lower surface, said at least one aperture being aligned with said at least one cushion cavity where it opens through the said cushion bottom face and being of sufficient cross sectional area to permit free movement of air therethrough,
whereby, seating pressure upon the top face of said cushion causes exhaustion of air in said cushion at least one cavity through the said at least one aperture in said support platform.

3,955,225
UPHOLSTERED ARTICLE AND METHOD

Donald D. Neefe, Rochester, N.Y., assignor to Sybron Corporation, Rochester, N.Y.

Filed Oct. 21, 1974, Ser. No. 516,384
Int. Cl.² A47C *7/02, 23/00*
U.S. Cl. 5—353.3 **4 Claims**



1. An upholstered article comprising:
a. a rigid pan having a plurality of openings therethrough spaced along and adjacent at least one side thereof, said openings each having an edge which together define an discontinuous internal edge of said pan adjacent and extending substantially parallel to said one side;
b. a cushion piece on the upper surface of said pan, said cushion extending over said openings to said one side;
c. upholstery material overlaying said cushion piece and extending down over said one side, said material having a crenellated edge, the crenels thereof each extending over the lower surface of said pan and being folded up through said openings over said internal edge towards said one side and on to said upper surface of said pan;
d. said crenels each having a root edge which together define a discontinuous datum line, said discontinuous datum line and said discontinuous internal edge of said pan cooperating to provide means for properly positioning said upholstery material with respect to said pan wherein the proper positioning is obtained when said datum line is superimposed on said internal edge; and
e. a spring wire clip for fastening each of said crenels to said internal edge.

3,955,226

PROCESS FOR HEAT FIXATION OF DYESTUFFS USING POLYESTER MATERIAL AS FILTER FOR CIRCULATING AIR STREAM

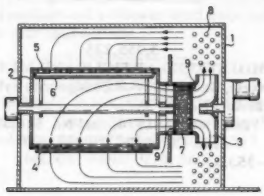
Erich Feess, Lorsbach, Taunus; Günther Trapp, Frankfurt am Main, and Heinz Fleissner, Egelsbach, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Feb. 12, 1974, Ser. No. 441,855

Claims priority, application Germany, Feb. 14, 1973, 2307086

Int. Cl.² D06B 3/02

U.S. Cl. 8—149.2 2 Claims



1. A process for the heat fixation of dyestuffs on textile articles comprising the steps of: passing a directional hot air of vapor flow through dyed or printed textile articles in a heat fixation zone; passing the said air or vapor flow coming from said fixation zone through a filter consisting of polyester material, in order to remove dyestuff particles from said air or vapor flow by absorption on said polyester material; and recirculating said air or vapor, from which the dyestuff particles have been removed, through said textile articles in said fixation zone.

3,955,227

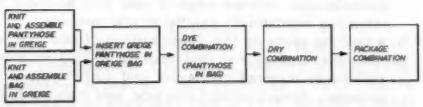
FOOTLETS, PANTYHOSE AND PROTECTIVE BAG THEREFOR

George Siegfried, Milton, Del., assignor to Sklaroff Bros., Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 341,018, March 14, 1973, Pat. No. 3,906,753. This application Nov. 14, 1973, Ser. No. 415,891

Int. Cl.² D06B 3/30

U.S. Cl. 8—150 2 Claims


KNIT AND ASSEMBLE PANTYHOSE IN GREIGE
KNIT AND ASSEMBLE BAG IN GREIGE
INSERT GREIGE PANTYHOSE IN GREIGE BAG
DYE COMBINATION (PANTYHOSE IN BAG)
DRY COMBINATION
PACKAGE COMBINATION

1. The method of producing a knitted combination article for subsequent packaging and sale as a unit, said article comprising a dyed, knitted garment disposed within a correspondingly colored dyed knitted bag, said bag serving as protective and laundering bag for said garment, the method comprising placing a greige knitted garment within a greige knitted bag, dyeing the combination with the garment in the bag so that the garment and the bag take on a corresponding color, and thereafter drying the combination with the garment still within the bag.

3,955,228

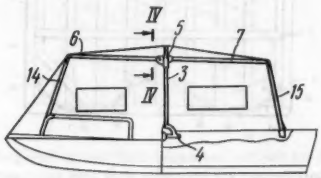
BOAT SHADE

Viktor Petrovich Gaschenko, Bolshoi Prospekt, 46, kv. 45; Vladimir Fedorovich Dzhulai, ulitsa Chekhova, 271"b", kv. 25; Vyacheslav Ivanovich Semenov, ulitsa Engelsa,201, and Viktor Alexeevich Serebryakov, ulitsa Svobody, 25/9, kv. 48, all of Taganrog, U.S.S.R.

Filed Aug. 19, 1975, Ser. No. 605,821

Int. Cl.² B63B 17/02

U.S. Cl. 9—1 B 4 Claims



1. A boat shade comprising: a cover and a frame, carrying said cover; said frame formed of three inverted U-shaped components; one of said inverted U-shaped components of said frame being erected vertically and fastened at its ends to the opposite sides of said boat with the possibility of being pivoted; two other inverted U-shaped components of said frame, arranged on both sides of the vertically erected U-shaped component and carrying said cover; sliders mounted on the sides of the vertically erected U-shaped component of said frame; hinges joining said sliders to the ends of the inverted U-shaped components carrying the cover; each of said hinges, joining each end of one of the inverted U-shaped components of said frame to one of said sliders, is formed by an axle mounted on the end of the inverted U-shaped component carrying the cover, and devised to move in a horizontal direction outwardly in relation to the vertically erected component of said frame, and is further formed by a bushing, mounted on one of said sliders; means mounted on each of said sliders for locking the axle of each of said hinges in the axle's extreme positions when the cover is unfolded or when one of its components, carrying the cover, is folded on the other.

3,955,229

RUBBER BOAT

Klaus Hanel, Carlsdorfer Strasse 3, 3520 Hofgeismar, Germany

Filed Feb. 20, 1974, Ser. No. 443,963

Claims priority, application Germany, Feb. 20, 1973, 2308357

Int. Cl.² B63B 7/00

U.S. Cl. 9—2 A 5 Claims

1. An inflatable rubber boat including:

an elongated inflatable sponson member defined by a flexible tubular wall;

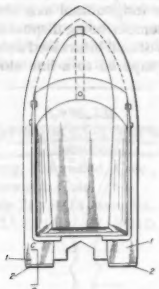
a rigid bulkhead member at the stern end of said sponson, adapted to provide radial support for said tubular wall;

an opening in said bulkhead member communicating with the inside of said sponson; and

a one-way flap valve member extending across and enclosing the inside of said opening whereby storage access is provided to the inside of said sponson, said flap valve member preventing the escape of pressurized gas therein;

said bulkhead member extending transverse the longitudinal axis of said sponson member and having an effective

diameter that is greater than the uninflated diameter of said sponson whereby upon inflation of said sponson said



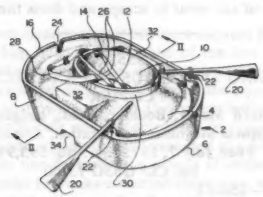
flexible wall extends to form a smooth coextensive and streamlined contour with the periphery of said bulkhead.

3,955,230

RECREATIONAL BUOYANCY DEVICE

Campbell Clifford Rogers, 865 Elsmore Road, and William Joseph Taylor, 355 Vinmore St., both of Richmond, British Columbia, Canada

Filed Feb. 10, 1975, Ser. No. 548,832
Int. Cl.² B63C *9/08*
U.S. Cl. 9—347 **9 Claims**



1. A portable, recreational, buoyancy device comprising an integral, rigid, ring-like floating unit having a central opening designed to accommodate the user's body, wherein said unit is of generally elongated shape, and has a flat bottom surface and an upper surface comprising elevated inner and outer rims, said outer rim circumscribing the periphery of said surface and said inner rim circumscribing said opening, and a generally frusto-conical central surface extending from the outer lower edge of said inner rim to the inner lower edge of said outer rim, means to support the user in said opening, means to suspend the unit from the shoulders of the user when in said opening and propelling means mounted on said unit.

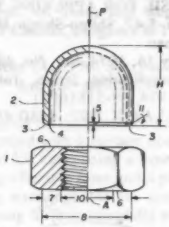
3,955,231

CUP NUT MASS PRODUCTION PROCESS

Heinz W. Erdmann, Hauptstrasse 51a, 5984 Garbeck, Germany

Continuation-in-part of Ser. No. 311,733, Dec. 7, 1972, abandoned. This application Sept. 18, 1974, Ser. No. 507,066
Claims priority, application Germany, Dec. 14, 1971, 2161790
Int. Cl.² B21D *53/24*
U.S. Cl. 10—86 C **7 Claims**

1. In a mass production process for welding metal parts of a cup nut together by means of resistance welding whereby the metal parts are pressed together briefly prior, during and briefly after the application of welding current, the improvement comprising deep drawing from sheet metal in a single step a cup which has a dome and an edge around its open end providing said edge of the cup in said single deep drawing step with an outwardly facing chamfer having an inwardly rising circular ridge, then substantially axially aligning said cup with a standard nut so that the inwardly rising circular ridge of the chamfer contacts a nut face, axially pressing the nut and cup together, applying welding current while maintaining said



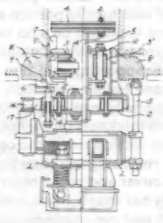
pressing, and removing said axial pressure briefly after the termination of the welding current whereby the material of the cup adjacent to said chamfer is used to form an inwardly facing one sided butt welding seam without a visible welding seam at the juncture of the nut and the outer edge of the cup and thus a machining of the welding seam is obviated.

3,955,232

COKE OVEN CLEANER

Nagayoshi Konno, Tokyo, Japan, assignor to Koritsu Kikaikogyo Co., Limited, Japan

Filed June 6, 1974, Ser. No. 476,904
Int. Cl.² C10B *43/04*
U.S. Cl. 15—93 A **7 Claims**



1. A coke oven cleaner, for cleaning the entrance of a coke oven chamber having a door frame with a door sealing surface, said cleaner comprising, in combination, an upright stationary holding means; a first scrapers-holding means reciprocable along said upright stationary holding means and carrying scrapers engageable with said door sealing surface; driving means operable to reciprocate said first scrapers-holding means; a second scrapers-holding means mounted on said first scrapers-holding means for movement therewith, and carrying scrapers engageable with the interior surface of said door frame and with the interior surface of said coke oven chamber; heat-blocking means movable together with said first and second scrapers-holding means, said heat-blocking means, in the operative position of said coke oven cleaner, being interposed between the interior of the coke oven and said first and second scrapers-holding means; said second scrapers-holding means comprising a pair of interdependent upright members interconnected by a plurality of pivotal linkages for movement toward and away from each other; and regulator means mounted on said first scrapers-holding means and operatively associated with said pivotal linkage to move said interdependent members toward and away from each other whereby said

interdependent members may be retracted toward each other for insertion of said second scrapers-holding means into door frame and then moved away from each other to engage the scrapers carried thereby with the interior surfaces of said door frame and of said coke oven chamber entrance.

3,955,233

TOILET UTENSIL FOR APPLYING TOILETRIES

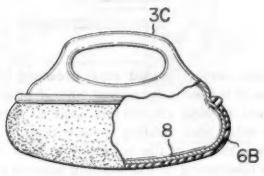
Kenji Nakamura, No. 5-47, Shimo-Shinjo, Higashi-Yodogawa, Osaka, Osaka, Japan

Filed July 16, 1974, Ser. No. 488,922

Claims priority, application Japan, July 21, 1973, 48-85860[U]; May 8, 1974, 49-51816[U]

Int. Cl.[2] **A47K** *7/02;* **A45D** *40/26*

U.S. Cl. 15—209 R **1 Claim**



1. A toilet utensil for applying toiletries, comprising:

a hollow elastic core having a substantially elliptical cross section holder portion and an integrally molded handle portion extending from one side of said holder portion, said core consisting of a single layer of flexible airtight film forming a continuously curved airtight body, said handle portion having a central part spaced from said holder by a hand receiving opening bounded by exterior surface portions of said handle portion and holder portion, the ends of said handle portion engaging the holder portion at spaced locations on said side thereof;

a filling for said core consisting of a quantity of gas packed in said core and supporting said film layer to shape said handle portion and holder portion;

a one-piece substantially cup shaped cover having a substantially uniform thickness throughout its area except for an enlarged cross section rim at the open end thereof, the diameter of the rim being less than the major diameter of the cup shaped cover and core holder portion, said cover being removably but snugly fitted over the holder portion of said core with said rim engaging said core intermediate the maximum width part of the holder portion and said handle portion to retain said cover on said core, the inner and outer surfaces of said cover being reversible and differently textured, one said surface being substantially smooth faced for spreading toiletries relatively thinly and the other being substantially pear skin-like for spreading toiletries relatively thickly, wherein such surfaces are alternatively usable by removal of the cover from the core, turning said cover inside out and replacing said cover on said core, said cover being of material nonabsorbent of said toiletries.

3,955,234

TOOL FOR DRESSING MEAT

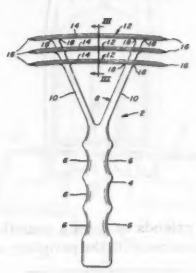
Thomas A. Roefaro, 2321 Saunder Station Road, Monroeville, Pa. 15146

Filed Oct. 16, 1974, Ser. No. 515,181

Int. Cl.[2] **A22B** *5/08;* **A22C** *17/00*

U.S. Cl. 15—236 R **2 Claims**

1. A one piece tool for dressing meat comprising an elongated plastic handle portion, said handle portion being formed with an integral resilient plastic bifurcated extension at one end, each branch of said bifurcated extension being of substantially uniform cross-sectional area less than that of the main unbifurcated body of said handle, at least one elongated blade member of resilient plastic integral with and spanning said bifurcated extension portion of said handle substantially perpendicular to the longitudinal axis thereof, the terminal ends of said blade member being disposed to extend laterally beyond the branches of said bifurcated extension portion, said terminal ends being tapered to a line along their transverse



edges whereby to form working edges on said blade adapted to be applied to a substantially flat surface of cut meat to scrape and dress the same, said blade member being integral in structure and having a elongated sexangular cross-section of substantially uniform width along its length, the two opposed outer longitudinal edges of said blade each being tapered to a line along their lengths whereby to form working edges on said blade adapted to be applied to a substantially flat surface of cut meat to scrape and dress the same.

3,955,235

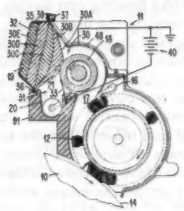
SCAVANGING APPARATUS FOR AN ELECTROSTATIC COPIER

Daniel Richard Meyer, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed July 7, 1975, Ser. No. 593,918

Int. Cl.[2] **G03G** *13/00*

U.S. Cl. 15—256.52 **4 Claims**



1. Improved scavanging apparatus including in combination:

an elongated rotatable scavanging roll having an axially elongated peripheral scavanging surface;

a housing enclosing said roll and having spaced-apart inlet and outlet openings elongated in a direction parallel with said roll, said housing being spaced radially from said roll to leave an air chamber therebetween and being in an air-sealing relation at the axial ends of said scavanging roll, said inlet and outlet openings being circumferentially spaced apart with respect to said scavanging surface, said roll being rotatable past said inlet opening in a first direction toward and past said outlet opening;

an elongated doctor blade in said housing and in cleaning contact with said scavanging surface length adjacent said outlet;

the improvement including in combination:

air chamber separator means disposed in said housing intermediate said inlet and said outlet along said first direction and extending radially toward said roll from said housing into partial cleaning contact with said scavanging surface and having filter means whereby particulate matter received through said inlet opening and not adhering to said scavanging surface is collected by said filter means.

3,955,236

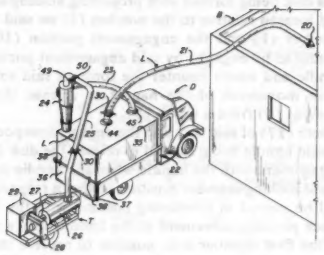
COLLECTOR SYSTEM IN A VACUUM SWEEPER CIRCUIT

Clayton G. Mekelburg, Lakewood, Colo., assignor to Richard W. Burt, Jr., Lakewood, Colo.

Filed July 26, 1974, Ser. No. 492,006

Int. Cl.² E01H *1/08*; B01D *50/00*

U.S. Cl. 15—314 **3 Claims**



1. In a vacuum cleaner circuit having a vacuum line extending from a pickup head at the intake of the line and an air pump at the exhaust of the line, a collector system to collect dust and rocks picked up at the intake of the line to remove the same from air flowing through the system before the air is discharged from the air pump, comprising in sequence:

a. a first separate compartment connected to a first reach of the vacuum line formed as a closed chamber having a closable outlet for rocks collected therefrom, wherein the first reach of the vacuum line from the pickup head is so connected so as to drop the rocks and like particles thereinto and to discharge air and dust in a second reach of the vacuum line extending from the first compartment;

b. a cyclone separator connected to the second reach of the line extending from the first compartment to separate dust particles from the airflow as it passes through the cyclone whereby to discharge substantially dust-free air through its clean air outlet into a third reach of the line connected to said clean air outlet of the cyclone;

c. a second separate compartment having a closable discharge outlet connected with the discharge of the cyclone to receive dust separated by the cyclone;

d. a filter connected to a third reach of the line extending from the cyclone and to the air pump whereby to remove any fine particles of dust which may pass through the cyclone separator;

e. means associated with both the discharge outlets of the first compartment and the second compartment to periodically discharge the rocks and dust collected in the respective compartments, said first and second compartments are formed within a single, box-like container with a closed top having the aforesaid first reach of the line entering said first compartment through the top thereof, whereby to facilitate the dropping of rocks and heavy particles picked up by the system into this compartment, and the aforesaid discharge means comprises a single gate opening both compartments when the gate is opened, and the second-mentioned reach of the line extending from the first compartment to the cyclone separator extends from the aforesaid top of the container, and the cyclone is positioned at the top of the container over the aforesaid second compartment to facilitate dropping dust separated by the cyclone directly into the second compartment.

3,955,237

COMBINATION CONVERSION AND STORAGE KIT FOR UPRIGHT VACUUM CLEANERS

Robert Chateauneuf, St. Jean, and Roger Ross, Mont St-Gregoire, both of Canada, assignors to The Singer Company, New York, N.Y.

Filed May 14, 1975, Ser. No. 577,381

Int. Cl.² A47L *9/00*

U.S. Cl. 15—323 **3 Claims**

1. A kit for adapting an upright vacuum cleaner of the type having a casing formed with a suction opening for above-the-floor cleaning, said kit comprising a housing, means on said housing for storing a flexible hose and a plurality of accessory nozzles selectively exchangeable on one extremity of said hose, said kit housing formed integrally with an air chamber, said air chamber having separate inlet and outlet openings, means for attaching the other extremity of said hose to said inlet opening, and means for supporting the kit on said vacuum cleaner with said outlet opening in sealed communication with the suction opening of said vacuum cleaner so that the air chamber integral with said kit is connected in series between the upright vacuum cleaner and any selected nozzle on said hose.

3,955,238

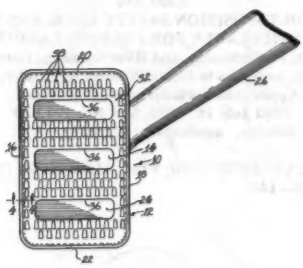
DOG BRUSH

Jerry Remijas, Chicago, Ill., assignor to Corporate Products Research, Chicago, Ill.

Filed Sept. 6, 1974, Ser. No. 503,961

Int. Cl.² A47L *5/00*, *9/06*

U.S. Cl. 15—402 **3 Claims**



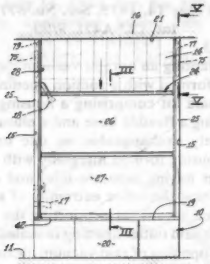
1. A brush for dogs and the like adapted to be attached to a vacuum cleaner, comprising a body providing a plenum, means on said body adapted for connection to a vacuum cleaner hose and opening into said plenum, a wall on said body having aperture means opening into said plenum, and a plurality of bristles on said wall arranged in a plurality of rows on opposite sides of and spaced from said aperture means and extending outwardly of said wall, said bristles being curved and having outer ends leading the ends secured to said wall in the intended direction of brushing and being positioned to avoid obstruction of said aperture means, said wall being longer in the intended direction of brushing than it is transversely therof and wherein the aperture means in said wall comprises a plurality of relatively narrow apertures elongated transversely of the direction of intended brushing, and rows of bristles are disposed between said apertures and outwardly thereof.

3,955,239

BATHTUB CLOSURE MEANS HAVING VERTICALLY SLIDABLE PANELS

Abraham Grossman, 9339 Rhea Ave., Northridge, Calif. 91324

Division of Ser. No. 362,743, May 22, 1973, Pat. No. 3,860,975. This application Oct. 10, 1974, Ser. No. 513,836
Int. Cl.[2] A47H 1/04, 15/00; E05D 13/02, 15/06
U.S. Cl. 16—96 R 6 Claims



1. In a panel guide and track construction for panels movable in frame means in spaced planes into and out of substantial overlapping relation along a track means, the provision of:

a hanger bar means including an elongated portion adapted to be secured to one of said panel members in spaced relation to said track means,

and a projecting portion extending into a guide channel in said track means for connection with a counterbalancing system;

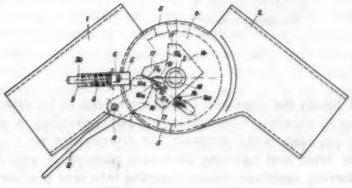
and means releasably fastening said hanger bar means to said track means.

3,955,240

MULTI-POSITION SAFETY LOCK JOINT, PARTICULARLY FOR FOLDING LADDERS

Karl Schuh, Pluderhausen, and Hans Schniepp, Lorch, both of Germany, assignors to Firma Wilhelm Bahmuller, Maschinen- und Apparatebau, Pluderhausen, Germany

Filed July 10, 1975, Ser. No. 594,820
Claims priority, application Germany, Apr. 5, 1975, 2514940
Int. Cl.[2] E05D 11/10; F16C 11/00; E06C 7/50
U.S. Cl. 16—144 8 Claims



1. Multi-position safety lock joint, particularly for use with folding ladders, having

a first, at least partly circular joint element (2) formed with peripheral notches (5),

a second, at least partly circular joint element (1),

a pivot member (3) passing through the center of said joint elements and connecting them together;

a resiliently biased locking element (6) located on the second joint element (1) and engageable with the notches (6) in the first joint element (2) to lock the two joint elements in relatively fixed position;

an operating handle (10, 12) pivoted (11) on the second joint element (1) having a manually operated portion (12) extending beyond the joint for manual operation thereof and an engagement portion (10) engageable with the locking element (6) to disengage the locking element from the notch (5);

and holding means (14) resiliently positioned and engageable with the handle (10, 12) in a first position to hold the handle in the position in which the locking element (6) is disengaged from a notch and, upon relative pivoting movement of the joint elements (1, 2), is released from the first engaged position with the handle to permit the locking element (6) to engage in a notch (5) and to lock the joint against relative rotation;

wherein

the holding means (14) comprises a disk (14) rotatable on the pivot member (3);

a spring (16) is provided secured to the joint and holding said disk (14) in a position other than said first position, said disk being formed with projecting holding teeth (17) and located relative to the notches (5) on said first joint member (1) and the engagement portion (10) of the handle to be engaged by said engagement portion of the handle and rotate counter the force of said spring (16) upon movement of the handle to release the locking element (6) from a notch (5),

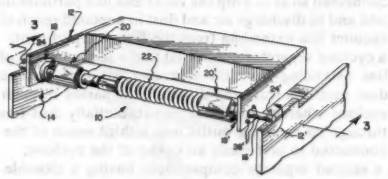
the teeth (17) of said disk and the engagement portion (10) of said handle being shaped to release the disk (14) from engagement with the handle when the handle has moved in the locking member position so that a respective tooth will be moved in interfering position with the handle to block pivoting movement of the handle until a notch (5) of the first member is in position to receive the locking member (6) located on the second member (1).

3,955,241

CAM OPERATED SPRING BIASED COUNTERBALANCE HINGE MECHANISM FOR CABINET LID OR THE LIKE

Carl H. Little, Jamestown, N.Y., assignor to Weber-Knapp Company, Jamestown, N.Y.

Filed Oct. 16, 1975, Ser. No. 622,875
Int. Cl.[2] E05F 1/12
U.S. Cl. 16—180 10 Claims



1. A combination hinge and counterbalance mechanism for hingedly mounting a lid on a cabinet for vertically directed swinging movements between first and second positions, said mechanism including:

an elongated hinge pin;

means adapted for removably fixing opposite ends of said hinge pin to said cabinet;

at least one cam member adapted to be fixed to said lid, said cam member being supported on said hinge pin for rotation about the axis thereof, while being constrained against movement in at least one direction axially thereof;

at least one cam follower member associated one with each said cam member, said cam follower member being supported on said hinge pin for reciprocating movements axially thereof while being constrained against rotation relative thereto; and

a spring assembly arranged for biasing said cam follower member for movement in said one direction into operative engagement with its associated cam member for

counterbalancing the torque effects of gravity on said lid throughout at least a substantial portion of the range of lid swinging movements, said cam member being configured to render said mechanism inactive for counterbalancing said torque effects at a point of lid swinging movements, whereby to permit said hinge pin to be removed from said cabinet when said lid is at said point of lid swinging movement in the absence of counterbalancing induced reaction forces therebetween.

3,955,242

PROCESS AND APPARATUS FOR FILLETING FISH

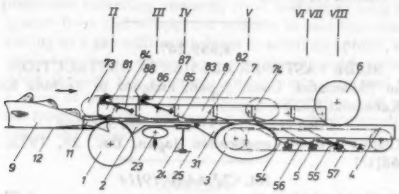
Franz Hartmann, Bad Oldesloe, Germany, assignor to Nordischer Maschinenbau Rud. Baader, Lubeck, Germany

Filed Apr. 1, 1974, Ser. No. 457,085

Claims priority, application Germany, Apr. 4, 1973, 2316791

Int. Cl.² A22C *25/16*

U.S. Cl. 17—57 **8 Claims**



1. A fish filleting machine which includes one pair each of circular belly spine knives, rib knives and back knives, said pairs of knives being spaced from each other along the length of said machine, conveyor means for transporting fish belly side down and tail leading successively past said belly spine knives, rib knives and back knives, a first pair of lower guides positioned between the belly spine knives and the rib knives, and a second pair of lower guides positioned between the rib knives and the back knives both for continuously guiding the bottom half of the tail fin and the strip of the skeleton containing the belly spines and produced by the belly knives, further pairs of upper guides positioned between the belly knives and the back knives for guiding the upper half of the tail fin and the dorsal fins, the further pairs of upper guides having adjacent ends which overlap in a direction opposite to the fish conveying direction, means mounting each of said further pairs of upper guides for vertical deflection upward as a fish is conveyed therebeneath, whereby said further pairs of upper guides are individually adjustable to height variations in said fish, the guides of each further pair of upper guides enclosing a slit that is disposed in the plane of symmetry of the knives, a first conveyor engaging the flanks of the fish from the outside until the ribs are cut free, and a further conveyor engaging the underside of the vertebrae after the ribs are cut free and until the fillets are cut off the bone structure.

3,955,243

APPARATUS FOR RECEIVING A SILVER CAN AND FOR CONTROLLING THE QUANTITY OF MATERIAL DEPOSITED THEREIN

Rolf Binder, Raterschen, Switzerland, assignor to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Sept. 24, 1974, Ser. No. 508,862

Claims priority, application Switzerland, Oct. 10, 1973, 14414/73

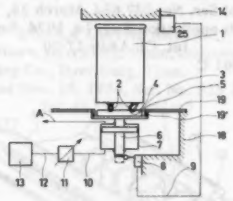
Int. Cl.² D01G *31/00*; B65H *54/76*

U.S. Cl. 19—.2 **7 Claims**

1. An apparatus for receiving a sliver can and for controlling the quantity of material contained in the sliver can comprising

a table for receiving a sliver can thereon;

means for yieldingly supporting said table including a compressed air cylinder, a piston slidably mounted in said cylinder and connected to said table, and a means for establishing the air pressure in said cylinder on the underside of said piston;



a sliver feeding device for delivering sliver to said can; and

a switching element connected to said sliver feeding device and responsive to a downward movement of said table and piston resulting from a preset quantity of material deposited in the sliver can for stopping continued delivery of material to the sliver can from said sliver feeding device.

3,955,244

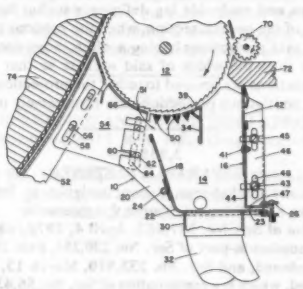
FIBER RETRIEVER

R. B. Jenkins, Jr., Gastonia, N.C., assignor to Jenkins Metal Shops, Inc., Gastonia, N.C.

Filed July 8, 1974, Ser. No. 486,515

Int. Cl.² D01G *15/82*

U.S. Cl. 19—107 **4 Claims**



1. In a carding machine having a feed roll and a lickerin roll equipped with a fiber retriever of the type comprising a pair of spaced planar partitions extending downwardly from the lickerin roll and a series of screen bars extending across the width of the lickerin roll forwardly of the planar partitions, the improvement comprising a vacuum source, a housing for enclosing the area beneath said bars and partitions wherein said bars and the upper edges of said partitions form the upper wall of said housing and one of said partitions forms the rear wall of said housing, said housing further including a front wall, a pair of end plates, a bottom wall, said bottom wall having an opening therein providing communication between the inside of said housing and said vacuum source, said rear wall including an opening through which air is drawn to replace the air drawn off by said vacuum source without disturbing the action of the fiber retriever, said bottom wall being hingedly attached at the front end thereof to the bottom edge of said front wall, and a removable retaining means holding said rear wall and the rear end of said bottom wall in a nor-

mally closed position, whereby when said retaining means is removed, said bottom wall swings away from said rear wall for access to the interior of said enclosure.

3,955,245

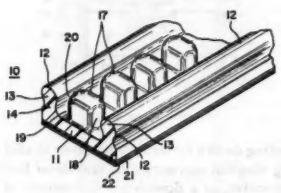
SEPARABLE INTERLOCKING FASTENERS

Gene Ballin, 159 Main St., Hempstead, N.Y. 11550

Continuation of Ser. No. 237,634, March 24, 1972, Pat. No. 3,829,938. This application Aug. 14, 1974, Ser. No. 497,464

Int. Cl. A44b *17/00*

U.S. Cl. 24—201 C 9 Claims



1. A flexible fastener section for detachably fastening with a second similar section when the sections are pressed together, comprising a base web having an upper and lower surface, a pair of projecting similar side legs longitudinally extending from and transversely spaced on the upper surface of the web, each of said legs having enlarged heads with upwardly converging top side faces and downwardly converging bottom side faces and longitudinal grooves in opposite faces substantially complementing the corresponding side faces of said enlarged heads, and a series of longitudinally spaced projections extending from said upper surface of said web medially between said side legs, confronting side faces of the projections and each side leg defining a socket for receiving a side leg of the second section, when the sections are pressed together, said projections having a width, a portion of which, is greater than the width of said sockets so that when said fastener sections are pressed together the projections interdigitate and contiguous projections are transversely offset.

3,955,246

SEPARABLE FASTENER

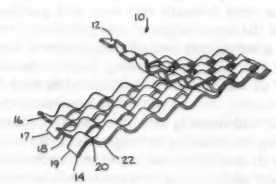
Akio Tanaka, Yokohama, Japan, assignor to International Fastener Establishment, Vaduz, Liechtenstein

Division of Ser. No. 347,683, April 4, 1973, which is a continuation-in-part of Ser. No. 230,254, Feb. 29, 1972, abandoned, and Ser. No. 233,910, March 13, 1972, abandoned, which is a continuation of Ser. No. 56,436, July 20, 1970, abandoned. This application Apr. 22, 1975, Ser. No. 570,556

Claims priority, application Japan, July 23, 1969, 44-57904; Mar. 1, 1971, 46-10264; Mar. 22, 1971, 46-16080; Feb. 4, 1972, 47-12756

Int. Cl.[2] A44G *17/00*

U.S. Cl. 24—204 11 Claims



1. A press-on separable fastener comprising:

first and second facing fastener portions,

each of said portions having a plurality of adjoining, longitudinal, undulating strips, each of said strips providing a series of spaced apart ridges,

within each of said portions, adjoining ones of said strips being longitudinally staggered relative to each other, the thickness of said strips being substantially less than the height of said ridges to provide openings under said ridges,

within each of said portions, a first one of said strips being laterally spaced from a third one of said strips by a second one of said strips, the lateral distance between the ridges of said first one of said strips and said third one of said strips being determined by the lateral width of said second one of said strips,

a plurality of projections, each of said projections extending laterally from said ridges of at least said first portion,

projections on the ridges in said first portion underlying the ridges on said second portion when said portions are engaged,

each of said portions being an integral element having substantial resilience.

3,955,247

SLIDE FASTENER ELEMENT CONSTRUCTION

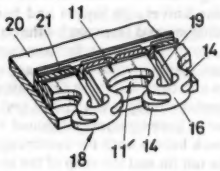
Ikuo Takamatsu, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Dec. 27, 1974, Ser. No. 536,804

Claims priority, application Japan, Dec. 29, 1973, 49-3168[U]

Int. Cl.[2] A44B *19/14*

U.S. Cl. 24—205.13 D 6 Claims



1. A slide fastener element construction which is formed from a pliable material substantially into a ladder-like structure, said structure comprising parallel base portions extending longitudinally of and at the outer sides of the structure, a plurality of pairs of element-forming members projecting in opposed relation inwardly of the respective base portions, enlarged coupling head portions integral with said element-forming members and located innermost of said structure and bridge portions extending transversely of said structure and adapted to connect the pairs of element-forming members, said structure being folded longitudinally on itself about said bridge portions, each element-forming member having an elongated slot extending transversely of said structure into said coupling head portion to impart resiliency to said element-forming member.

3,955,248

SLIDE FASTENER SLIDER

Shunji Akashi, Kurobe, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed May 22, 1975, Ser. No. 579,827

Claims priority, application Japan, May 31, 1974, 49-63485[U]

Int. Cl.[2] A44B *19/26, 19/30*

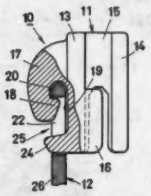
U.S. Cl. 24—205.15 R 2 Claims

1. A slide fastener slider comprising:

an upper and a lower wing interconnected at one end by a neck portion;

a hook-shaped lug integral with and projecting upwardly from said upper wing and terminating in a free end bent downwardly toward and in opposed relation to the top surface of said upper wing;

a pull tab having an elongate opening and a transversely extending pintle pivotally connected to said lug; and



a projection extending upwardly from said upper wing and spaced from and in opposed relation to said free end of the lug by a gap sufficiently large to admit said pintle, said projection being adapted to engage with said opening when the pull tab is moved into contact with said top surface of the upper wing, thereby preventing said pull tab from becoming displaced relative to the longitudinal axis of the slider.

3,955,249

CLAMPING DEVICE

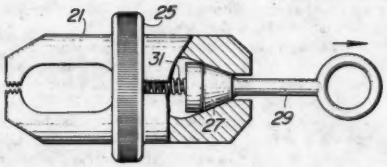
Hiromitsu Shiozaki, 93, Aza Yashiki, Tosakicho, Okazaki, Aichi, Japan

Filed July 2, 1974, Ser. No. 485,280

Claims priority, application Japan, July 5, 1973, 48-76371

Int. Cl.[2] B21D *11/02*; A44B *21/00*

U.S. Cl. 24—251 **10 Claims**



1. A clamping device comprising

a. at least two clamping members each having a clamping jaw section at one end thereof and a clamping guide section at the other end thereof;

b. an inner fulcrum member positioned between and supporting said clamping members so as to enable said clamping members to pivot about said inner fulcrum member, said inner fulcrum member also being positioned between the ends of each of said clamping members;

c. an outer retaining ring surrounding and supporting said clamping member at positions diametrically opposed to that of said inner fulcrum member so as to pivotally retain said clamping members with respect to said inner fulcrum member;

d. a tapered member disposed within a space defined by and located between said clamping guide sections of said clamping members, said member having a tapered outer peripheral surface arranged such that when said tapered member is displaced to move said tapered outer peripheral surface into contact with inner surfaces of said clamping guide sections, said clamping guide sections are moved away from each other thereby forcing said clamping jaw sections to move toward each other by pivotal movement of said clamping members about said inner fulcrum member, the clamping force at said clamping jaw sections being increased as the displacement of said tapered member is increased.

3,955,250

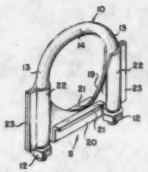
U-BOLT CLAMP SADDLE

John E. Heckethorn, Dyersburg, Tenn., assignor to Heckethorn Manufacturing Co., Dyersburg, Tenn.

Filed Nov. 19, 1974, Ser. No. 525,225

Int. Cl.[2] B65D *63/00*

U.S. Cl. 24—277 **3 Claims**



1. A U-bolt clamp saddle body comprising a pair of identical oblong planar sheet metal work engageable webs welded together in parallel full face contact, a U-bolt leg receiving portion at each end of each web integral therewith, each web having an edge portion doubled back upon itself in full planar face contact with the outer face of its web and terminating in a laterally out-turned flange extending for substantially the entire length of the web intermediate said U-bolt leg receiving portions and parallel to the longitudinal axis of the web, both said flanges being in a common plane and normal to the plane of interface contact between the inner faces of the webs, the upper edge of each web defining a work engaging edge portion, said flanges being disposed below said edge portions.

3,955,251

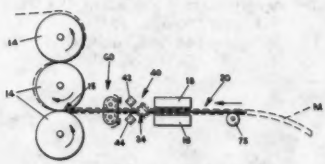
FABRIC SPREADING AND STRETCHING APPARATUS

Warren Hogendyk, 4017 Bell, NE., Grand Rapids, Mich. 49505

Division of Ser. No. 518,490, Oct. 29, 1974. This application June 16, 1975, Ser. No. 587,420

Int. Cl.[2] D06C *5/00*

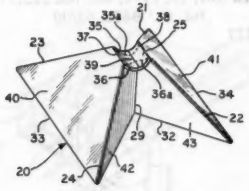
U.S. Cl. 26—80 **7 Claims**



1. Stretching apparatus adapted for use with a calender machine for processing tubular textile fabrics to prevent damage to the fabric comprising a frame for stretching and spreading a length of such tubular textile fabric, said frame adapted to be inserted within and entirely surrounded by the tubular fabric; support means external of said frame and fabric when said fabric is stretched over and around said frame for locating said frame with respect to said fabric; and magnetic repulsion means providing a magnetic repulsion force for repelling said frame away from said support means to counterbalance the force of said fabric against said frame when said fabric is

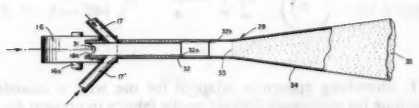
stretched over said frame and drawn toward said support means.

3,955,252
COLLAPSIBLE CORPSE POSITIONER AND RESTRAINER
Louis J. Reda, 1645 N. Oak Park Ave., Chicago, Ill. 60635
Filed Sept. 30, 1974, Ser. No. 510,394
Int. Cl.[2] A61G 17/00
U.S. Cl. 27—12 4 Claims



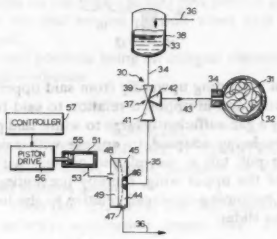
1. A corpse positioner and restrainer comprising:
a substantially rigid and substantially rectangular member having weakened diagonal portions terminating in a center, cradling portion; said cradling portion adapted to be placed under a predetermined anatomical portion of a corpse for supporting said anatomical portion; means defining cutout portions disposed on opposite sides of said cradling portion; and transverse portions defined by a crease through said cutout portions and through the center of said rectangular member, said crease extending perpendicularly from one side of said rectangular member to the opposite side thereof; said transverse portions being adapted to form vertical supports for said cradling portion upon folding said rectangular member along said weakened diagonal portions and along said crease.

3,955,253
STRAND TREATMENT APPARATUS
Robert K. Stanley, Media, Pa., assignor to Textured Yarn Co., Kennett Square, Pa.
Continuation-in-part of Ser. No. 405,262, Oct. 11, 1973, Pat. No. 3,896,529, which is a continuation-in-part of Ser. Nos. 343,644, March 22, 1973, Pat. No. 3,840,950, and Ser. No. 376,890, July 5, 1973, and a continuation-in-part of Ser. No. 124,213, March 15, 1971, Pat. No. 3,753,275, which is a continuation-in-part of Ser. No. 822,429, May 7, 1969, Pat. No. 3,570,083, which is a continuation-in-part of Ser. No. 678,428, Oct. 26, 1967, Pat. No. 3,462,814, and Ser. No. 302,758, July 31, 1963, Pat. No. 3,376,622. This application Oct. 31, 1974, Ser. No. 519,519
Int. Cl.[2] D02G 1/20
U.S. Cl. 28—1.3 6 Claims



1. In apparatus for crimping a textile strand by longitudinal compression, having an entrance and an open exit for such strand and having means laterally confining the strand for forwarding therebetween including successive entrance, intermediate, and exit portions, and means for injecting fluid into the entrance portion for use in forwarding such strand, the improvement wherein the exit portion is rigid and comprises a laterally surrounding fine screen having a flared outlet portion.

3,955,254
APPARATUS FOR TREATING YARN WITH FLUID MATERIAL
Christian Delarue, Meyzieu, and Roger Vidal, Champagne Au Mont d'Or, both of France, assignors to Rhone-Poulenc-Textile, Paris, France
Filed Apr. 17, 1974, Ser. No. 461,755
Claims priority, application France, Apr. 18, 1973, 73.14499
Int. Cl.[2] D06B 11/00; D02G 1/12
U.S. Cl. 28—1.6 9 Claims

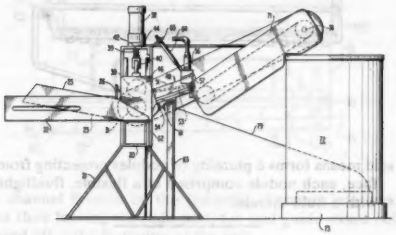


1. Apparatus for impinging a plurality of dyes on compacted yarns as the yarn progresses through a crimping tube comprising:
a plurality of individual fluid circuits, wherein each circuit includes means for circulating dye therethrough;
means for connecting each of the fluid circuits to the tube;
means for diverting dye from each of the circuits through the connecting means and into the tube to impinge dye from each of the circuits on the compacted yarn;
means associated with each circuit for interrupting the circulation of dye through each circuit so as to flow the dye through the associated diverting means; and
means connected to each circuit for activating each interrupting means according to selected patterns to selectively generate patterns of impingement of each of the dyes onto the compacted yarn, wherein the activating means is a reciprocating piston, which is controlled to selectively compress a fluid, and wherein the interrupting means is a diaphragm pushed by the compressed fluid to block said circuit means.

3,955,255
TEXTILE CRIMPING APPARATUS
Richard E. Shields, Jr., Lincoln, Del., assignor to John C. Draper, Milford, Del.
Filed June 27, 1975, Ser. No. 591,119
Int. Cl.[2] D02G 1/12
U.S. Cl. 28—1.6 12 Claims

1. A textile crimping apparatus comprising a tray adapted to receive a textile web in loosely defined form, a trumpet arranged near one end of said tray and somewhat thereabove to receive said web, converging fluid jet nozzle means associated with the tray and assisting in delivering said web to the mouth of the trumpet in a more concentrated form, a pair of superposed web feed and compression rolls receiving the web immediately behind the trumpet, a stuffing box receiving the web from said rolls and mounted directly therebehind, the stuffing box having a hinged top plate which is vertically shiftable, power means for exerting a controlled downward pressure on said top plate, an elevating power conveyor for a crimped web receiving the web immediately rearwardly of

said stuffing box, and a rotatable web coiling and storage receptacle beneath the rear discharge end of the power conveyor and offset laterally therefrom, and common power means driving said rolls, conveyor and receptacle.



3,955,256

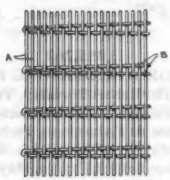
PROCESS FOR THE PRODUCTION OF A CARBON TAPE

Im Keun Park, Summit, N.J., assignor to Celanese Corporation, New York, N.Y.

Division of Ser. No. 347,594, April 3, 1973, Pat. No. 3,859,158, which is a division of Ser. No. 135,698, April 20, 1971, Pat. No. 3,779,789. This application July 31, 1974, Ser. No. 493,630

Int. Cl.² B29C *25/00*

U.S. Cl. 28—72 R **10 Claims**



1. A process for the production of a carbon tape of an open weave construction suitable for use as a fibrous reinforcing medium in a pervious low density carbon fiber reinforced composite article comprising:

a. providing a continuous length of a fibrous open weave tape comprising a plurality of adjacent substantially parallel and laterally spaced linear warp ends of an organic polymeric fibrous material capable of undergoing conversion to a carbonaceous fibrous material substantially coextensive with the length of said tape wherein no substantial lateral contact is made between said adjacent warp ends, and a fibrous weft pick interlaced with said warp ends in a plain weave construction at a frequency of about 2 to 8 picks per inch of said tape with said weft pick being provided under a tension sufficient that said linear configuration of said warp ends is substantially unimpaired, and

b. continuously passing said tape in the direction of its length through a series of heating zones while substantially suspended therein to form a fibrous tape which contains at least 90 percent carbon by weight while preserving an open weave construction within said resulting tape wherein no substantial contact is made between said laterally adjacent warp ends.

3,955,257

REVOLVING TOOL HOLDER FOR A ROTARY MACHINE SUCH AS A LATHE OR DRILL

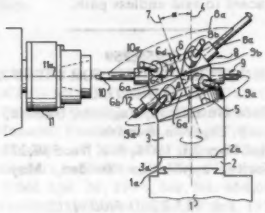
Friedrich-Wilhelm Herbst; Hans-Joachim Koch, both of Hannover; Wolfgang Schaefer, Langenhagen; Dieter Schneider, Langenhagen; Kurt Schünhoff, Langenhagen; Friedrich Ullrich, Garbsen, and Arnold Wesche, Schulenberg, all of Germany, assignors to Max Muller Brinker Maschinenfabrik Zweigniederlassung der Gildemeister Aktiengesellschaft, Bielefeld, Langenhagen, Germany

Filed July 3, 1975, Ser. No. 593,063

Claims priority, application Germany, July 26, 1974, 2436220

Int. Cl.² B23B *3/18*

U.S. Cl. 29—36 **10 Claims**



1. In a tool-holding turret for a rotary machine, such as a lathe, having a base member disposed on a cross-slide rest and rotatable in relation thereto about a first axis of rotation, a rotary turret head being disposed on said base member, and rotating about a second axis of rotation, inclined to said first axis of rotation at an offset angle, the improvement wherein said turret head has a first ring of tools and a second ring of tools, each said ring having the shank axis of its tools lying on the conical surface of an imaginary cone, there being a separate cone for each said ring, the cones being mirror images of each other; the vertices of the two cones coinciding and both lying on the said second axis of rotation, the sum of half the vertex angle of the cone plus the offset angle of said second axis from said first axis being a right angle.

3,955,258

MULTIPLE-PURPOSE MACHINE TOOL

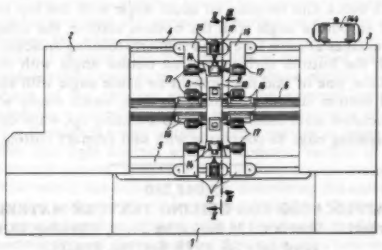
Hermann Flisch, Malenfeld, Switzerland, assignor to Eunipp AG, Zug, Switzerland

Filed Aug. 30, 1974, Ser. No. 502,002

Claims priority, application Switzerland, Sept. 14, 1973, 13194/73

Int. Cl.² B23P *23/00*

U.S. Cl. 29—38 R **12 Claims**



1. In a multiple purpose machine tool, particularly in a machine tool for turning, boring, drilling, grinding and/or milling of metallic workpieces, a combination comprising a

frame having two spaced-apart frame members flanking a working station; an indexible work supporting carrier located at said station and having a plurality of work-clamping devices movable along an endless path in response to indexing of said carrier; a pair of disk-shaped holders at opposite sides of the carrier and confining the latter for indexing movement therebetween; a plurality of elongated guide members extending in substantial parallelism with the axis of said carrier, fixed at outer ends to said frame members and rigidly connected to each other by said holders; at least one of said guide members being located outwardly adjacent to said endless path and at least one other guide member being located inwardly adjacent to and at opposite sides of said endless path; and a plurality of tool carriages mounted on and movable longitudinally of said guide members so that said tool carriages are respectively located inwardly to opposite sides of said endless path and outwardly adjacent to said endless path.

3,955,259

REVERSIBLE CUTTING INSERT FOR USE IN A ROTARY CUTTING TOOL

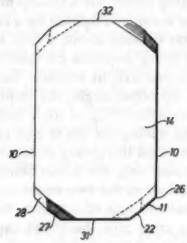
Manfred Wallace Gustafsson, Fagersta, Sweden, assignor to Sesco Tools AB, Fagersta, Sweden

Filed May 23, 1975, Ser. No. 580,221

Claims priority, application Sweden, May 24, 1974, 7406908

Int. Cl.² B26D *1/00, 1/12*

U.S. Cl. 29—95 R **4 Claims**



1. A reversible cutting insert for a milling cutter having sites for holding the insert in different cutting positions, said insert being in the shape of a rectangular block of cutting material comprising two opposite and parallel top and bottom surfaces, two opposite and mutually parallel edge surfaces located between said top and bottom surfaces both of which intersect with said top and bottom surfaces at right angles to define four parallel primary cutting edges, each end of said block having four bevel faces extending across such end from said top surface to said bottom surface, two side-by-side bevel faces at each block end forming an acute angle with the top surface and an obtuse angle with the bottom surface, the other two bevel faces at same block end similarly forming an acute angle with the bottom surface and an obtuse angle with the top surface, one of said junctions at an acute angle with said top and bottom surfaces defining an edge which meets with an associated main cutting edge into a cutting tip, while defining a finishing edge to cooperate with said primary cutting edge.

3,955,260

APPLICATOR FOR CEILING TEXTURE MATERIAL

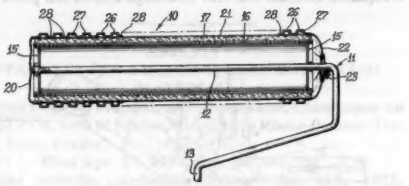
Herbert O. Sherden, 136 Berkshire Drive, Wheeling, Ill. 60090

Filed July 16, 1975, Ser. No. 596,393

Int. Cl.² B21B *27/02*

U.S. Cl. 29—121 R **4 Claims**

1. In a roller apparatus for applying a texture coating material to a surface such as a wall, which apparatus comprises a roller and means about said roller forming an applicator face, the improvement wherein:



said means forms a plurality of nodules projecting from said face, each nodule comprised of a flexible, fluidtight wall with a fluid therein.

3,955,261

EMBOSSED DECORATIVE FACING PANEL

Carl Appel, Renngasse 6, 1010 Vienna; Wilhelm Heiss, Rustenstrasse 2, Gmunden, Upper Austria, and Helmuth Gsöllpointner, Enzmullner Weg 32, Linz, Donau, all of Austria

Division of Ser. No. 331,095, Feb. 9, 1973, Pat. No. 3,839,893.

This application May 23, 1974, Ser. No. 472,826

Claims priority, application Austria, Feb. 17, 1972, 1319/72

Int. Cl.² B44C *5/04*

U.S. Cl. 29—180 SS **6 Claims**

1. In an improved decorative panel of nonferrous metal for covering facings wherein the panel has an embossed or textured surface, the improvement comprising an embossed surface having areas of uneven raised intermediate portions together with areas of irregular depressions having varying depths and uneven bottoms, said irregular depressions having a width of at least 10 mm, a depth varying between 10 to 30 % of the thickness of said panel and wherein the area of the bottoms of said irregular depressions occupy at least 20 % of the surface of said panel.

3,955,262

BLANKS FOR WIREDRAWING BY IMPACT

Robert Gauvry, Paris; Robert Portalier, Ville d'Avray, both of France, and Constantin Catsaros, Athens, Greece, assignors to Societe de Vente de l'Aluminum Pechiney, Paris, France

Filed May 7, 1974, Ser. No. 467,640

Claims priority, application France, May 9, 1973, 73.16624

Int. Cl.² B21C *1/00*

U.S. Cl. 29—190 **1 Claim**

1. Blanks for impact extrusion in which the blanks are formed of aluminum alloy subjected to a previous refining treatment, characterized by a fine, dense crystalline structure with axial symmetry, which is substantially homogeneous and by a reduced extension of the rough basaltic crystallization which at no point reaches the peripheral zone of the blank.

3,955,263

METHOD AND DEVICE FOR CLOSING THE FASTENER QF A BELT, MORE PARTICULARLY A TEXTILE BELT

Maurice Gauthier, Hiersac, France, assignor to COFPA-Compagnie des Feutres pour Papeteries et des Tissus Industriels, Le Gond-Pontouvre, France

Filed Mar. 3, 1975, Ser. No. 554,546

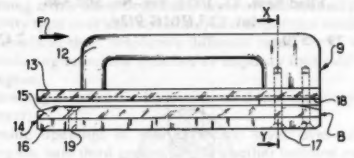
Claims priority, application France, Mar. 4, 1974, 74.07297

Int. Cl.² B23P *19/00*

U.S. Cl. 29—200 P **14 Claims**

1. Device for closing the fastener of a belt, more particularly a textile belt, which comprises two ends provided with fastening elements such as series of loops, clips, spirals or the like, the fastening elements of one end of the belt interlocking with those of the other end to form at least one channel, the fastening being locked by a wire passing along the whole length of the channel, comprising a guide strap detachably fixed along the whole length of each end of the belt, each guide strap

comprising a guide ramp and a slide part for bringing the said ends progressively closer together, the said slide part bearing on the said guide ramps, a wire being progressively inserted in



each channel formed by the fastening elements interlocked before their leaving the slide part, the said guide straps being removed after the fastening of the belt.

3,955,264

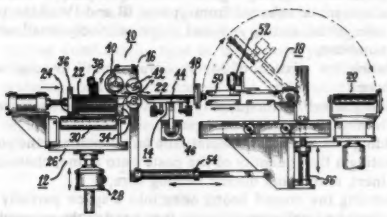
CORE STEEL STACKING MACHINE

Willi Klappert, 9005 Alcosta Blvd., Apt. 205, San Ramon, Calif. 94583

Filed July 18, 1975, Ser. No. 597,196

Int. Cl.² H01F *41/02*

U.S. Cl. 29—203 L **5 Claims**



1. A magnetic core steel stacking machine comprising

a. a stacking table for receiving a plurality of cut core laminations,

1. an automatic lifting device for raising such stacking table to a transfer mechanism,

b. said transfer mechanism including a magnetic roll for removing the top lamination from said plurality of cut core laminations on said stacking table,

c. a transfer table for receiving individual laminations from said transfer mechanism

1. said transfer table having indexing means for indexing said transfer table a predetermined distance after receiving each individual lamination,

whereby the ends of adjacent laminations on said transfer table are offset from each other the same distance as said predetermined index distance.

3,955,265

METHOD OF APPLYING A PATCH TO A SURFACE

Egon Evertz; Rolf Seybold, and Heinz Willi Stracke, all of Solingen, Germany, assignors to Egon Evertz, Solingen, Germany

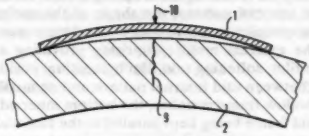
Filed Mar. 24, 1975, Ser. No. 561,313

Claims priority, application Germany, Apr. 10, 1974, 2417428

Int. Cl.² B22D *19/10*; B23P *7/04*

U.S. Cl. 29—402 **3 Claims**

1. A method of applying a patch of an elastic metal material to a surface, and in particular to a wall of a steelwork ingot mould to be repaired, the method comprising placing a piece of said material on said surface in such a manner that a curved clearance is formed between the material and the surface, the clearance being defined and limited by the contact engagement of the marginal edges of the piece of material with the surface, subjecting the piece of material so placed in its middle



region to a pressure at least sufficient to elastically deform this region into face contact with the surface, and subsequently firmly securing the terminal portions of the piece of material to said surface.

3,955,266

VACUUM SEALED MOLDING PROCESS FOR PRODUCING MOLDS HAVING A DEEP CONCAVE PORTION OR A CONVEX PORTION

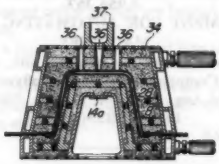
Norimitsu Honami; Yasuhiro Uno, both of Toyokawa; Tamotsu Ito, Toyohashi, and Mitsuhide Ogura, Toyokawa, all of Japan, assignors to Sintokogio, Ltd., Nagoya, Japan

Filed Apr. 26, 1974, Ser. No. 464,683

Claims priority, application Japan, May 2, 1973, 48-49375; Sept. 25, 1973, 112044[U]

Int. Cl.² B22C *9/00*; B29C *1/02*, *17/04*

U.S. Cl. 29—421 R **1 Claim**



1. A process of making a mold composed of an internal and external complimentary mold halves respectively having a high convex portion and a deep concave portion comprising:

a. making the internal mold having a deep concave portion of an external pattern, the shape of the surface of said external pattern being complimentary to that of the high convex portion of the internal mold comprising providing a synthetic resin film; softening said film by heating; positioning said film between said external pattern and an auxiliary convex member which has a convex surface facing the film generally complimentary to that of the concave portion of the external pattern; moving said auxiliary convex member toward the bottom of the external pattern with the peripheral portion of the film contacting the edge portion of the concave portion of the external pattern such that the film is deformed around said auxiliary convex member in a shape similar to the shape of the concave surface of the external pattern; applying a negative pressure to the outer surface of the film through the wall of the external pattern to bring the film into tight contact with the concave surface of the external pattern; removing the auxiliary convex member from within the external pattern; assembling the external pattern with the film thereon and a molding flask; positioning a cup shaped frame with an opening formed in the bottom thereof in the molding flask; placing a heat resistant particulate material in the space between the bottom portion of the cup shaped frame and the bottom portion of the external pattern through the opening; covering the opening with a film; releasing the negative pressure on the outer surface of the film; applying a negative pressure to

the inner surface of the film through the particulate material to bring the film in tight contact with the particulate material; and removing the external pattern from the molding flask, thereby forming the internal mold;

b. making the external mold having a high convex portion of an internal pattern, the shape of the surface thereof being complimentary to that of the deep concave portion of the external mold comprising providing a synthetic resin film; softening said film by heating; positioning said film between said internal pattern and an auxiliary external hollow frame member, the bottom inner edge portion of said frame being kept parallel to the film and the inner space of said frame being large enough to cover a substantial portion of the convex portion of the internal pattern; pushing said film with said frame toward the convex portion of said internal pattern until the film is deformed similar to the shape of the convex surface of the internal pattern; applying a negative pressure to the inside surface of the film through the wall of the internal pattern to bring the film into tight contact with the convex portion; removing the auxiliary external frame member from the internal pattern; assembling the internal pattern with the film thereon and a molding flask; placing a heat resisting particulate material onto the film; releasing the negative pressure on the inner surface of the film; applying a negative pressure to the outer surface of the film through the particulate material to bring the film into tight contact with the particulate material; and removing the internal pattern from the molding flask, thereby forming the external mold; and

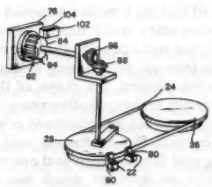
c. assembling the internal and external molds.

3,955,267

ATTACHMENT FOR AUTOMATING MILLING MACHINES

David Edward deCaussin, Northridge, Calif., assignor to Fadal Engineering Company, Inc., North Hollywood, Calif.

Filed Aug. 26, 1974, Ser. No. 500,441
Int. Cl.² B23Q 3/157
U.S. Cl. 29—568 **2 Claims**



1. In a machine tool having a machine tool spindle adapted to be driven at various speeds the combination comprising a plurality of sequentially attached tool holding stations,

each of said tool holding stations adapted to hold a tool holder,

indexing means for indexing said tool holding stations past a given home position,

a single cam assembly comprising a rotary drum having a plurality of settable cams, one for each tool holder located along the periphery of said drum and driven by said indexing means in time sequence with said holding stations, each settable cam having two separate camming surfaces for contacting two separate switch means,

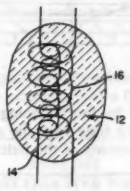
a numerical controller adapted to generate a tool speed change signal and in which one of said cams controls a first switch means for generating a first signal to change the tool spindle speed in a given direction said spindle speed being appropriate for each said tool holder.

3,955,268

METHOD OF FABRICATING AN ELECTROLYTIC CELL GAS SENSOR

Chen-Yen Chou, and Su-Chin Chou, both of 900 N. Broadway, Suite 725, Santa Ana, Calif. 92701

Filed Sept. 13, 1974, Ser. No. 505,546
Int. Cl.² H01G 9/24
U.S. Cl. 29—570 **7 Claims**



1. The method of fabricating a solid state electrolytic cell gas sensor head for detecting gases by dissociating the gases into species such as ions and complex ions and using either to generate an electrical signal, comprising:

adding at least one metal oxide having a general formula MxOy, where M is a transition element metal, to a non-metal oxide having a general formula NpOq, where N is a non-metal selected from groups III and IV of the periodic table, and x, y, p and q are relatively small whole numbers;

heating the mixture of MxOy - NpOq until dry and activated;

adding a sufficient quantity of solvent to the mixture of MxOy - NpOq to form a paste;

adding a small amount of platinum family oxide to the paste;

coating a first quantity of the paste onto a fine, chemically inert, strong and ductile heating wire;

inserting the coated heater wire into a space partially defined by a collector wire and then coating the assembly of the heater wire and the collector wire with the paste to form a bead with both wires therein;

drying the paste; and

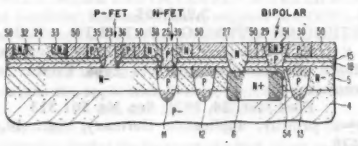
baking the paste at at least one temperature in excess of 200°C to form the sensor head.

3,955,269

FABRICATING HIGH PERFORMANCE INTEGRATED BIPOLAR AND COMPLEMENTARY FIELD EFFECT TRANSISTORS

Ingrid Emese Magdo, and Steven Magdo, both of Hopewell Junction, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 19, 1975, Ser. No. 588,524
Int. Cl.² B01J 17/00
U.S. Cl. 29—577 **23 Claims**



1. A method for fabricating dielectrically isolated bipolar and field effect transistors comprising:

introducing into a first region of a monocrystalline semiconductor substrate of a first conductivity type an impurity of the opposite conductivity type to form the subcollector region of said bipolar transistor;

introducing impurities of said first conductivity type into second and third regions of said substrate, said second region surrounding said first region, the diffusion rate of the impurity in said first region being slower than the diffusion rate of the impurity in said third region;

forming a first monocrystalline layer of said second conductivity type over said substrate, said impurities outdiffusing therein at their respective diffusion rates;

introducing an added quantity of impurity into said second region;

depositing a dielectric layer over said first monocrystalline layer;

forming openings in said dielectric layer over said first region, said third region, and at another location over said first monocrystalline layer;

epitaxially depositing a second layer of silicon over said dielectric layer and in said openings, thereby forming monocrystalline regions over the first monocrystalline layer exposed by said openings and polycrystalline regions over the insulating layer;

the impurities in said third region outdiffusing into the monocrystalline region thereover, to form a channel region of a field effect transistor;

the impurities in said first region outdiffusing sufficiently slowly so as not to come in contact with the monocrystalline region disposed thereover;

dielectrically isolating said monocrystalline regions of said second epitaxial layer from one another; and

selectively forming emitter and base regions of a bipolar transistor in said monocrystalline region disposed over said subcollector region, source and drain regions of a second conductivity type in the monocrystalline region disposed over said third region to form a field effect transistor of a second channel type, and source and drain regions of first conductivity type in the monocrystalline region disposed over said other location to form a field effect transistor at a first channel type.

3,955,270

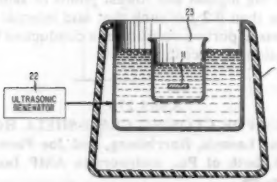
METHODS FOR MAKING SEMICONDUCTOR DEVICES

Andrew Loya, Irvington, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 393,596, Aug. 31, 1973, Pat. No. 3,863,333. This application Nov. 15, 1974, Ser. No. 524,059

Int. Cl.² B01J *17/00*

U.S. Cl. 29—580 **5 Claims**



1. A process for making semiconductor devices comprising the steps of:

forming a first thin metal layer on one side of a semiconductor wafer;

forming a second metal layer on the opposite side of the semiconductor wafer;

defining a plurality of devices by, first, etching part of the second metal layer, second, etching a corresponding part of the semiconductor wafer, third, immersing the wafer in a liquid, and fourth, subjecting the wafer to non-localized ultrasonic agitation of said liguid, said agitation being of sufficient intensity to rupture the first thin metal layer, thereby to break apart the defined devices.

3,955,271

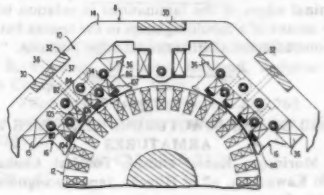
DYNAMOELECTRIC MACHINERY

Walter F. Boesel, Palos Verdes Estates, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Division of Ser. No. 509,977, Sept. 27, 1974, Pat. No. 3,885,302, which is a division of Ser. No. 383,174, July 27, 1973, Pat. No. 3,859,549. This application Jan. 7, 1975, Ser. No. 539,194

Int. Cl.² H02K *15/06*

U.S. Cl. 29—596 **2 Claims**



1. A method of assembling a pole shoe for a dynamoelectric machine, said shoe including a base section and a tip section; said shoe sections being relatively separable and defining open-ended slot means for the reception of compensating coil means; said method including the steps of:

installing compensating coil means into said slot means;

inserting a plurality of strand-like elements into said slot means so that said strand-like elements lie between said compensating coils and walls of said slot means

then clamping said base and tip sections together such that said compensator coil windings are braced by said strand-like elements,

then inserting a liquid binder material into said slot means, and

allowing said binder material to cure so as to bond said strand-like elements together and to said wall means defining said slot means.

3,955,272

METHOD FOR MAKING A STATOR FOR ELECTRIC MOTORS

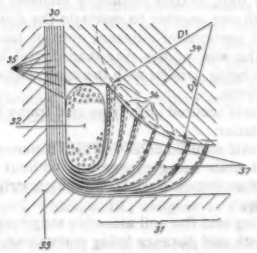
Stig Lennart Hallerback, Vastra Frolunda, Sweden, assignor to SKF Industrial Trading and Development Company, B.V., Jutphaas, Netherlands

Division of Ser. No. 420,877, Dec. 3, 1973. This application Oct. 10, 1974, Ser. No. 513,772

Claims priority, application Sweden, Dec. 21, 1972, 16772/72

Int. Cl.² H02K *15/12*

U.S. Cl. 29—596 **7 Claims**



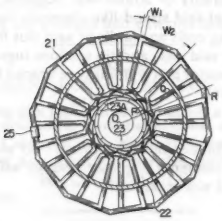
1. Method of making a stator for electric motors comprised of a plurality of laminations arranged with their sides in the direction of the rotor axis, the edge portions of the laminations running in the axial direction being bent inwardly towards the

stator bore and maintained in spaced-apart relation at a predetermined position and being permanently fixed in this position solely by means of a moulded compound each main pole consisting of the lamination edges of two adjacent lamination stacks, each lamination stack consisting of undivided laminations comprising a north and a south pole, consisting of the steps of positioning the laminations between a pair of inner and outer mould members wherein the inner mould member has means for supporting the terminal edges of the laminations in predetermined spaced-apart relation and disposed along the circumference of a circle and thereafter permanently fixing the terminal edges of the laminations in relation to one another by means of a moulding mass in the spaces between the laminations adjacent their terminal edge portions.

3,955,273
METHOD OF MANUFACTURING FLAT TYPE WOUND ARMATURES

Shigeki Morinaga; Kazuo Onishi; Toshimi Abukawa, and Syoichi Kawamata, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 31, 1975, Ser. No. 546,150
Claims priority, application Japan, Feb. 1, 1974, 49-12784
Int. Cl.² H01R *43/06*
U.S. Cl. 29—597 **6 Claims**

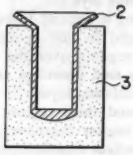


1. A method of manufacturing a flat type wound armature having a ring-shaped coil assembly comprising the steps of:
preparing a cylindrical winding frame, said cylindrical winding frame being capable of being disassembled and having guide pieces arranged in rows and columns on the peripheral surface of the winding frame to define annular slits and longitudinal spacings between adjacent ones of said guide pieces;
winding insulated conductors in each of said annular slits of said frame to form equally spaced coils at each slit;
applying a thin, flexible insulating member to secure said coils with one another to maintain the distance between identical portions of adjacent ones of said coils and to define the size of the ring-shaped coil assembly, said distance being parallel with the central axis of said cylindrical frame;
removing said secured coils from said frame by disassembling the latter;
flattening said secured coils with said distance between said adjacent coils being maintained without changing the shape of each coil, thereby forming a strip of a flat coil assembly;
transforming said flat coil assembly strip into a planar ring shape with said distance being maintained, such that said coils are annularly equally spaced from and partially equally overlapped with adjacent ones of said coils; and
joining the ring shape coil assembly with the coils at the ends of said coil assembly being joined by an insulator to have a mutual arrangement identical to that of other adjacent two coils of said ring shape coil assembly.

3,955,274
METHOD OF MANUFACTURING A LOW ENERGY-LOSS WAVEGUIDE CIRCUIT ELEMENT

Kuninori Imai, Kanagawa, and Akihiko Higurashi, Tokyo, both of Japan, assignors to Hitachi Electronics, Ltd. and Hitachi, Ltd., both of, Japan

Continuation-in-part of Ser. No. 327,161, Jan. 26, 1973, abandoned. This application Dec. 30, 1974, Ser. No. 537,951
Claims priority, application Japan, Aug. 25, 1972, 47-84534; United Kingdom, Jan. 24, 1973, 3663/73; Germany, Jan. 23, 1973, 2303184; France, Jan. 25, 1973, 73.02684
Int. Cl.² H01P *11/00*
U.S. Cl. 29—600 **5 Claims**



1. A method of manufacturing a waveguide circuit element comprising the steps of:
preparing a low resistivity metal film and a base metal, wherein the ratio of the flow stress of the film metal to that of the base metal is not more than 1.5, each of said low resistivity metal film and said base metal having at least one major surface,
cleaning the respective major surfaces of said low resistivity metal film and said base metal,
overlaying in a die cavity of a female die said low resistivity metal film on said base metal with said respective cleaned major surface in facing relationship, and
forming a conductive internal surface inside a recessed portion within said base metal by
pressing a male die of a desired shape into said base metal through said low resistivity metal film by
cold processing at a low processing speed of not higher than 1 mm/sec. and an area reduction rate of not larger than 70% so as to cause a plastic strain in the base metal, said recessed portion being formed with a thick side wall, said conductive internal surface of said recessed portion being formed of a uniform thin layer of said low resistivity metal film, and said conductive internal surface being formed with a surface finish wherein the difference in height between the highest and lowest points of said surface is not more than 0.2 μm such that said internal surface of said recessed portion constitutes a conductive surface for transmission of electric waves.

3,955,275
APPARATUS FOR CLOSING CLAM-SHELL HOUSINGS

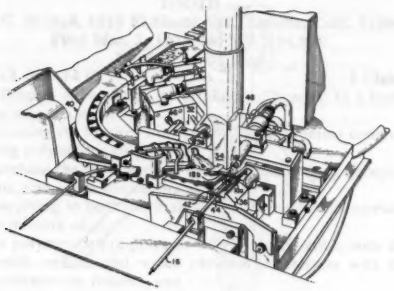
Phillip Eugene Loomis, Harrisburg, and Joe Pierce Morgan, Camp Hill, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 368,159, June 8, 1973, abandoned. This application Aug. 7, 1974, Ser. No. 495,370
Int. Cl.² H01R *43/00*; H05K *13/04*; H01R *43/04*
U.S. Cl. 29—628 **21 Claims**

1. An apparatus for closing clam-shell housings about articles such as electrical connectors, each of said clam-shell housings initially being interconnected to a plurality of other unassembled plastic clam-shell housings by integral hinge members, and each of said unassembled plastic clam-shell housings including first and second opposed housing sections, said plurality of clam-shell housings being joined together in such a manner that relative pivotal movement of the first and second housing parts of one of the unassembled housings towards and away from each other will cause corresponding relative pivotal movement of the integral hinge members

which will in turn cause corresponding relative pivotal movement of the first and second housing parts of an adjacent housing; said apparatus including:

means to position a first open clam-shell housing of said plurality of interconnected housings at an assembly station;



means to place an electrical terminal within the first open clam-shell housing; and

means operable to move the opposed housing parts of a second clam-shell housing of said plurality of interconnected housings towards each other to cause the first and second opposed housing parts of the first clam-shell housing to move towards each other over said terminal.

3,955,276

ELECTRICALLY MOTOR DRIVEN CAN OPENER

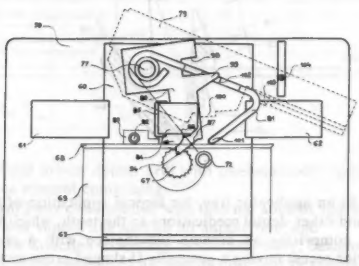
Bernard Pauty, Quetigny, France, assignor to Societe Anonyme Etud, Dijon, France

Filed June 28, 1973, Ser. No. 374,783

Claims priority, application France, June 30, 1972, 72.23724; Jan. 3, 1973, 73.00118

Int. Cl.² B67B 7/38

U.S. Cl. 30—4 R **16 Claims**



1. In an electrically operated can opener of the kind having an electric drive motor, a cutting member, an operating lever pivotally mounted to said opener about a fixed axis so as to be movable between operating and non-operating positions, can drive means drivingly connected to the drive motor for rotating the can and can positioning means for positioning the can, the improvement comprising:

rotatably mounting said lever, cutting member and an elastic element about the same fixed axis so that each is independently movable with respect to each of the others, wherein said cutting member having a cut-out portion defined by top and bottom edges and at least one side edge, said elastic element being positioned and movable within said cut-out portion, said lever having first and second stop members to respectively engage said elastic element and said cutting member wherein the rotation and movement of the elastic element into an operating position is controlled by said first stop member, the movement of the elastic element during operation is under the joint control of one of said first stop member and said top and bottom edges, while the rotation of said elastic element to a non-operating position is controlled by the bottom edge of said cut-out portion and wherein the rotation and movement of said cutting member between operating and non-operating positions is controlled by said second stop member.

3,955,277

ADJUSTABLE RAZOR BLADE UNIT

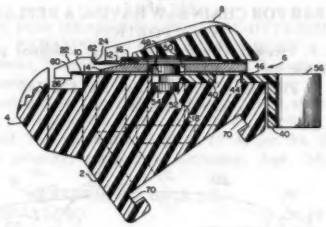
Edward E. Pomfret, Newbury, England, assignor to The Gillette Company, Boston, Mass.

Filed Sept. 17, 1974, Ser. No. 506,762

Claims priority, application United Kingdom, Sept. 20, 1973, 44265/73

Int. Cl.² B26B 21/22

U.S. Cl. 30—47 **4 Claims**



1. A razor blade unit comprising a platform member having a guard portion and coupling structure for detachably connecting said platform member to a cooperating handle component, a cap member permanently fastened to said platform member, a blade means permanently disposed between said platform member and said cap member, said blade means comprising a spacer member and first and second blade members respectively adjacent first and second sides of said spacer member, said spacer member having means integral therewith for retaining said first and second blade members, said blade means being slidably movable longitudinally of said blade unit, cam means disposed on said blade unit for displacing said blade means transversely of said blade unit in response to such longitudinal movement, and lever means disposed on said blade unit, said spacer member having means for receiving a portion of said lever means, said lever means being operable to effect said longitudinal movement of said spacer member and through said first and second blade retaining means longitudinal movement of said first and second blade members responsive to pressure applied to said lever means in a direction generally transverse to said blade unit, thereby to cause movement of said blade means relative to said guard portion to vary the distance between a cutting edge of said blade means and said guard portion.

3,955,278

CUTTING BOARD AND KNIFE SET

Samuel J. Popell, Chicago, Ill., assignor to Popell Brothers, Inc., Chicago, Ill.

Filed Jan. 10, 1975, Ser. No. 540,239

Int. Cl.² B26B 11/00

U.S. Cl. 30—124 **9 Claims**

1. A cutting board and knife combination comprising, in combination,

a cutting board having an upper cutting surface and a handle extending from one end thereof,

a locking recess within the cutting board handle

a knife having a handle portion with a sectional configuration complementary to the recess in the cutting board handle to nest therein

and snap acting locking means in the cutting board handle and the knife handle for coactingly securing the knife handle within the recess, the knife blade being positioned atop the cutting board surface.

3,955,279

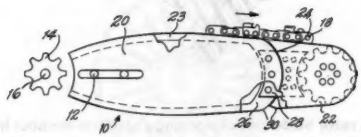
GUIDE BAR FOR CHAIN SAW HAVING A REPLACEABLE NOSE PORTION

William F. Pierson, Oregon City, Oreg., assignor to Omark Industries, Inc., Portland, Oreg.

Filed May 19, 1975, Ser. No. 578,461

Int. Cl.² B27B *17/04*

U.S. Cl. 30—384 **3 Claims**



1. A guide bar for a saw chain comprising; a main portion and a nose portion, said main portion having an outer end edge convexly curved and said nose portion having an inner end edge concavely curved, removable fastening means for removably securing said nose portion to said main portion with said end edges being mated and in abutment, the side edges of the main portion and the nose portion having aligned grooves for receiving the drive tangs of the saw chain to guide the chain along the side edges of the bar, said side edges of the main portion forming obtuse angles with the convex end edges of the main portion, and means at the outer end of said nose portion to guide the saw chain from one side edge of the guide bar around the nose to the other side edge of the guide bar.

3,955,280

DENTAL IMPLANTS

Meer Sneer, 24 Baalei Melacha St., Tel Aviv, Israel

Filed Oct. 17, 1973, Ser. No. 407,244

Claims priority, application Israel, Oct. 18, 1972, 40611; Aug. 31, 1973, 43125

Int. Cl.² A61C *13/00*

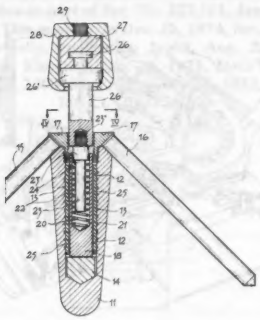
U.S. Cl. 32—10 A **6 Claims**

1. An endosseous dental implant, for use in a two-stage implant method, comprising in combination

a conical foundation member adapted to be inserted into an alveole and corresponding in shape as closely as possible to said alveole, or into a hole bored into the jaw-bone, and to be held therein in a secure manner,

said foundation member having a longitudinal bore open at the top thereof provided with a thread at its upper end, said foundation member being provided with an external layer of a biologically acceptable porous material consisting of pores having a pore size of 60–100 microns and a plurality of lateral protrusions adapted for firmly and rigidly engaging the surrounding bone to anchor the foundation member therein, and

a second member adapted to carry an artificial dental element at one of its ends, the other end being provided with



a threaded shank adapted to be threaded into the bore of the conical foundation member, and

effective shock-absorbing means being provided on top of said second member for cushioning stresses during the chewing of food.

3,955,281

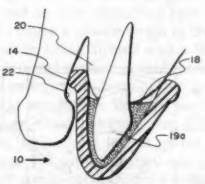
DISPOSABLE DENTAL TRAY FOR TOPICAL APPLICATION OF FLUORIDE GEL AND OTHER DENTAL MEDICATIONS

Stewart Weltzman, Portland, Oreg., assignor to Pacemaker Corporation, Portland, Oreg.

Filed Dec. 5, 1974, Ser. No. 529,609

Int. Cl.² A61C *7/00*

U.S. Cl. 32—14 B **4 Claims**



1. In an applicator tray, for topical application of fluoride gel and other dental medications to the teeth, which is of the type comprising an arcuate mouthpiece with a channeled interior recess having a generally U-shaped cross-section and configured to fit over either of the upper and lower teeth of the mouth, the improvement wherein said tray consists essentially of a molded unitary element comprised of flexible, nonhydrotropic, fine-cell, cross-linked polyethylene foam material having a cell size in the range of 2–3 mils, a density in the range of 1.6–2.4 lbs/ft³, a water absorption factor of about 0.1% by volume in a 24-hour period, a tensile strength of about 40 psi and an elasticity, measured by percent elongation to fracture, of about 275, and the bottom and wall surfaces of the interior recess forming said U-shaped channel are anatomically configured at the time of molding of said tray with indentations adapted to mate in reverse impression with the mouth dentition pattern, whereby a comfortable, non-gagging fit of said tray inside the mouth is obtained with said bottom and wall surfaces of said tray being in close proximity to the tooth surfaces and the perimeter of the tray walls being flexed by the bite of the mouth to contact the adjacent periodontal

tissue to thereby provide a snug seal therewith and prevent the contamination and dilution by saliva of medication contained in said tray.

3,955,282

PROCESS OF MOUNTING ORTHODONTIC BRACKET TO TOOTH

Earl G. McNall, 1510 El Monte Ave., Arcadia, Calif. 91006

Filed Mar. 3, 1975, Ser. No. 554,870
Int. Cl.² A61C 7/00
U.S. Cl. 32—14 C 5 Claims

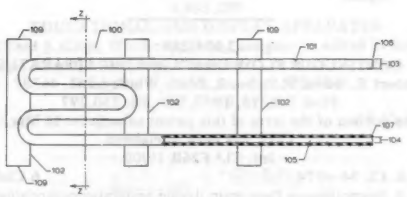
1. Process of mounting an orthodontic bracket to a tooth, comprising the steps of:
1. coating the bracket with a bracket base coating comprising polysulfone or polyether sulfone;
2. etching the tooth surface with a gel comprising phosphoric acid and a thickening agent;
3. applying to both tooth and bracket a sealant comprising a mixture of:
a. a polymer or pre-polymer which is compatible with the tooth enamel and which chemically interacts with the adhesive (to follow), and
b. benzoyl peroxide or derivatives thereof;
4. coating the bracket with an adhesive comprising a mixture of:
a. methyl and/or ethyl methacrylate, and
b. monomers of butyl and higher acrylates and/or methacrylates;
5. applying the bracket to the prepared tooth surface.

3,955,283

FLEXIBLE HANDPIECE MOUNTED CONTROL FOR DENTAL DRILLS

Timothy William Mehallick, P.O. Box 12, Scottdale, Pa. 15683

Filed Oct. 31, 1974, Ser. No. 519,746
Int. Cl.² A61C 19/02
U.S. Cl. 32—26 7 Claims



1. A fluid driven dental drill with pneumatically operated handpiece control comprising:
a. a drill body dimensioned with internal annular spaces for a water supply line and an air supply line; and
b. a tube attached externally to the drill body, designed to permit the passage of air and of sufficient flexibility that a pressure of 2.0 ± 0.5 ounces to the outside diameter causes a first noticeable obstruction to the passage of air through the tube and a 4.0 ± 0.5 ounce pressure causes complete obstruction to the passage of air through the tube, adapted to be connected to an air supply source on the one hand and an exhaust on the other.

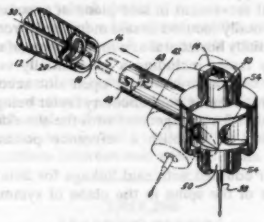
3,955,284

DISPOSABLE DENTAL DRILL ASSEMBLY

John E. Balson, Church Road, Devon, Pa. 19333

Filed Jan. 2, 1975, Ser. No. 537,960
Int. Cl.² A61C 1/10
U.S. Cl. 32—27 29 Claims

1. A dental handpiece including a handle and a self-contained dental drill assembly, said dental drill assembly a housing and a rotor member rotatably including mounted therein, said rotor member being formed with turbine blades and being fixedly and non-removably secured to the end of a dental burr, said housing being removably connected to said handle by



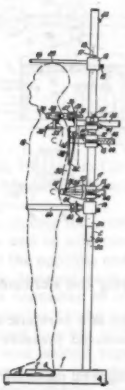
interlocking coupling means, said handle being formed with a passage in communication with a passage in said housing, said passage in said housing being arranged to direct a fluid against said turbine blades to rotate said rotor member.

3,955,285

DEVICE FOR MEASURING POSTURE-DETERMINING PARAMETERS OF A HUMAN BODY

Ernst Moeckl, Wangener Hohe-Durrbach 1, 7 Stuttgart-Wangen, Germany

Continuation of Ser. No. 362,631, May 21, 1973, abandoned, which is a continuation of Ser. No. 30,906, April 22, 1970, abandoned. This application Sept. 9, 1974, Ser. No. 504,288
Claims priority, application Germany, Apr. 24, 1969, 1920766
Int. Cl.² G01B 5/20
U.S. Cl. 33—174 D 18 Claims



1. A device for measuring posture-determining parameters of a human body, comprising:
a base forming a stepping surface for a person to be measured;
an upright column rising from said base;
a plurality of vertically displaceable slides carried at different levels on said column and including a lower slide, a higher slide and a further slide above said higher slide;
feeler means mounted on said slides for engagement with the body of a person standing on said stepping surface, said feeler means including a pair of shoulder feelers mounted on said further slide with freedom of movement in a substantially horizontal plane on opposite sides of the plane of symmetry of said body, a kyphosis feeler on said higher slide, and a lordosis feeler on said lower slide, said kyphosis and lordosis feelers being movable transversely

to said column for contact with an upper and a lower region of the spine of said body, respectively;

a linkage interconnecting said kyphosis and lordosis feelers;

a member supported on said further slide for substantially horizontal movement in said plane of symmetry;

a holder pivotally secured to said member for rotation about a substantially horizontal axis in said plane of symmetry;

an ancillary feeler including a substantially vertical plate provided with a downwardly open slot accommodating said kyphosis feeler, said ancillary feeler being carried on said member for engagement with the shoulder blades of said person to establish a reference position for said member; and

an indicator coupled with said linkage for determining the curvature of the spine in the plane of symmetry of said body;

said shoulder feelers including a pair of swingable arms pivoted on said holder and a pair of measuring heads carried on the extremities of said arms, each of said measuring heads including a plurality of sensors for simultaneous engagement of a shoulder of said person at different points.

3,955,286

METHOD OF AND INSTALLATION FOR TREATING VARIOUS OBJECTS BY MEANS OF MICROWAVES

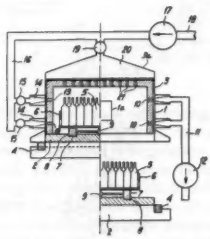
René Anrep, 29 bis rue Carnot, Suresnes, Hauts-de-Seine, France

Filed Oct. 9, 1974, Ser. No. 513,462

Claims priority, application France, Oct. 12, 1973, 73.36532

Int. Cl.² F26B *3/34*

U.S. Cl. 34—1 **7 Claims**



1. A method for drying and sterilizing objects, comprising the steps of:

a. placing said objects in a hermetic enclosure;

b. providing a pre-selected pressure within said hermetic enclosure;

c. directing electromagnetic radiation onto said objects; and

d. repetitively decreasing and increasing the pressure within said hermetic enclosure while maintaining said electromagnetic radiation.

3,955,287

SUPERHEAT APPARATUS FOR DRYING TEXTILE PRODUCTS

James Donald Brock, and Erbie Gail Mize, both of Chattanooga, Tenn., assignors to Astec Industries, Inc., Chattanooga, Tenn.

Filed Aug. 22, 1974, Ser. No. 499,577

Int. Cl.² F26B *13/02*

U.S. Cl. 34—155 **14 Claims**

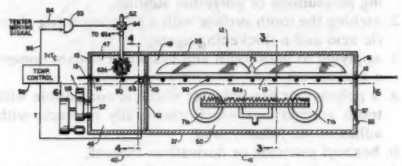
1. Dryer apparatus for removing moisture entrained in a porous web of material, comprising:

first housing means defining a first region through which said web of material is initially moved while said web divides said first region into a first zone on one side of the web and a second zone on the other side of the web;

second housing means contiguous to said first housing and defining a second region through which said web of material is subsequently moved after exiting said first region while said web divides said second region into a third zone on said one side of the web and a fourth zone on said other side of the web;

first means operative to maintain a differential fluid pressure across said web between said first and second zones to establish fluid flow through the porous web moving through said first region;

second means operative to maintain a differential fluid pressure across said web between said third and fourth



zones to establish recirculating fluid flow through the porous web moving through said second region;

first heating means operative to heat the fluid in said first region before flowing through the web therein;

second heating means operative to heat the recirculating fluid in said second region;

conduit means in fluid flow communication between said first and second regions; and

means operative to withdraw fluid from said first region so as to withdraw a portion of the recirculating heated fluid from said second region through said conduit means and into said first region to be heated by said first heating means and then flowed through the web in said first region.

3,955,288

CONTINUOUS FLOW GRAIN DRYING APPARATUS

Robert E. Kelrn, R.R. No. 2, South Whitley, Ind. 46787

Filed Feb. 18, 1975, Ser. No. 550,297

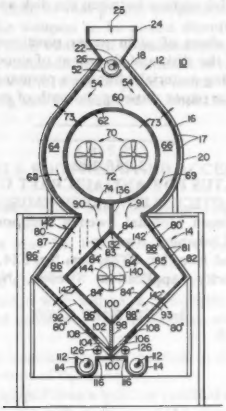
The portion of the term of this patent subsequent to Mar. 11, 1992, has been disclaimed.

Int. Cl.² F26B *19/00*

U.S. Cl. 34—174 **6 Claims**

1. In continuous flow grain drying apparatus comprising an upper, foraminous drying enclosure having a top end and an open bottom end, means communicating with said top end for introducing grain to be dried to said upper enclosure for downward gravity flow therethrough, first, enclosed, foraminous duct means in said upper enclosure for defining therewith a first pair of passages therein thereby dividing said downward flow into two separate, parallel streams, means communicating with said first duct means for causing an outward flow of heated air simultaneously through said first passages, a lower foraminous cooling enclosure having an open top end connected to said bottom end of said upper enclosure and having a bottom end, second, enclosed, foraminous duct means in said lower enclosure for defining therewith a second pair of passages therein, first divider means connecting said first and second duct means and extending through said open ends of said enclosures for coupling respective ones of said first and second passages whereby said two streams respectively continue separate, downward, parallel flow through said second passages, means communicating with said second duct means for causing an outward flow of cooling air simultaneously through said second passages, said cooling air flow being discharged to the atmosphere, said heating and cooling air flows being in parallel, first and second discharge openings in the side wall of said lower enclosure respectively communi-

cating with said second passages for separately discharging said streams therefrom, and second divider means extending downwardly from said second duct means between said first and second openings for completing separation of said second passages whereby said two streams are maintained separate without co-mingling throughout their downward flow through



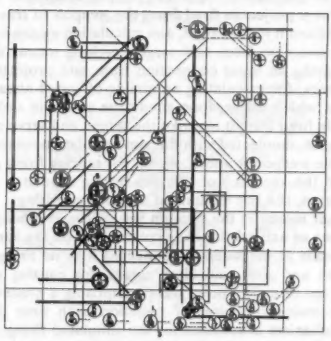
said apparatus, said lower enclosure and second duct means being respectively formed to divide each of said second passages into upper and lower sections; the improvement wherein said upper passage sections are respectively wider than said lower passage sections whereby the grain in said upper passage sections is cooled more slowly than the grain in said lower passage sections thereby temper-cooling said grain.

3,955,289

EDUCATIONAL AND DISPLAY APPARATUS

Clifford J. Gillis, Winthrop, Mass., assignor to Alfred B. Ramage, Alston, Mass., a part interest

Filed Jan. 3, 1975, Ser. No. 538,331
Int. Cl.² G09B *19/22*
U.S. Cl. 35—8 R **10 Claims**



1. Educational and display apparatus for concisely depicting a sequence of events involving multiple entities which comprises:

a. a stratum comprising an enclosed area which represents the surface on which said sequence of events takes place;

b. first indicia associated with said stratum, said first indicia representing said multiple entities and arranged spacially within said enclosed area, said spacial arrangement being representative of the present and past spacial arrangement of said multiple entities with respect to one another; and

c. second indicia associated with said first indicia within said enclosed area which depict:

1. the events which each of said entities experienced;

2. the sequence in which said events were experienced; and

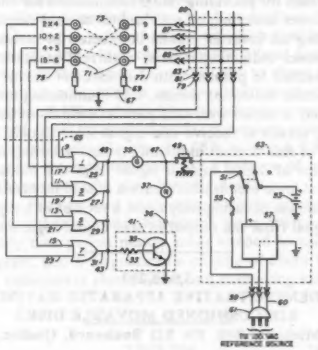
3. the interactions between said entities whereby a visual representation is provided, without reference to indicia outside said enclosed area, of the events and sequence of events experienced by said entities and the resultant interactions between said entities.

3,955,290

LEARNING DEVICES

Armand Jay Filer, 2406 Addison Circle, Thousand Oaks, Calif. 91360

Filed June 5, 1975, Ser. No. 584,159
Int. Cl.² G09B *7/10*
U.S. Cl. 35—9 C **7 Claims**



1. A Programmable Electronic Circuit for Acknowledging Receipt of Manually-Made Correct and Incorrect Information Matches, comprising:

a. A bifurcated conductor for probing, having two flexible branches at one end of said conductor, said conductor being singular at the opposite end, said singular end connected to electrical ground, each of said flexible branches having a contact connected to its mobile end;

b. A means for signaling having a plurality of inputs separated into an equal number of first and second inputs, each said first and second input having a receptacle contact, said first input receptacle contacts positioned adjacent to separate stimuli, each of said second input receptacle contacts positioned adjacent to separate responses, a plurality of outputs separated into an equal number of first and second outputs, a selected contact of each first and second input receptacle contacts of said signaling means separately receiving a digital logic 0 signal when electrical continuity is made with either branch contact of said flexible conductor, whereby separation of at least one of said selected input receptacle contacts from at least one of said flexible branch contacts causes a digital logic 1 signal to be received at said selected receptacle contact inputs, said received digital logic signals simultaneously appearing at respective first and second outputs of said signaling means;

c. A digital logic means having a plurality of input pairs, each of said pairs having a first and second input, said digital logic means having a plurality of singular outputs connected in parallel, first inputs of each pair of said

digital logic means connected respectively to first outputs of said signaling means;

d. A means for selective programming of second outputs of said signaling means, connected in series between second inputs of said digital logic means and respective second outputs of said signaling means, so that said programming means is interchangeable, said programming means having a matrix with a plurality of spaced substantially horizontal conductors dielectrically separated from a plurality of spaced substantially vertical conductors, said substantially horizontal conductors respectively connected to second inputs of said digital logic means, said substantially vertical conductors respectively connected to second outputs of said signaling means, said substantially vertical and horizontal conductors of said matrix selectively interconnected so that said digital logic signals can be programmed for transmission from any second output of said signaling means to any second input of said digital logic means, whereas digital logic 0 signals initiated by electrical contact with contacts of said flexible branches can be transmitted from a selected first input and a selected second input of said signaling means to any input pair of said digital logic means;

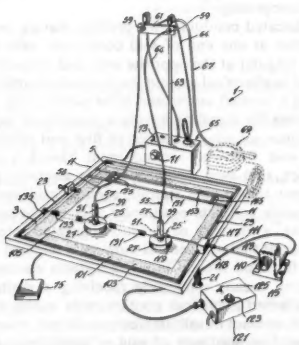
e. A means for providing visual illumination for correct and incorrect matching of said stimuli to said responses, including an inverter means connected in series with an incorrect indicating means, a correct indicating means connected in parallel with said inverter means and said incorrect indicating means, said illuminating means connected in series with said parallel outputs of said digital logic means to receive said digital logic signals, illumination of said correct indicating means occuring only upon receipt of digital logic 0 signal from the output of said digital logic means, illumination of said incorrect indicating means occuring only upon a receipt of a digital logic 1 signal from the output of said digital logic means.

3,955,291

DEMONSTRATIVE APPARATUS HAVING AIR-CUSHIONED MOVABLE DISKS

Eugene Michaud, 840, Pie XII Boulevard, Quebec, Quebec, Canada

Filed Jan. 9, 1975, Ser. No. 539,869
Int. Cl.² G09B 23/10
U.S. Cl. 35—19 R **11 Claims**



1. In a demonstrative apparatus, particularly for use in demonstrating physical laws having a table, at least one movable substantially annular disk on the table, means for producing a substantially uniform cushion of air between the table and the disk to cause floating of the disk above the surface of the table, a spark generator electrically connected to the disk, means in the disk for transmitting sparks produced by the spark generator to a ground surface, and means between the ground and the disk to record the sparks when the disk is moved, the improvement comprising:

a. the table having an insulative surface,

b. the disk having a bottom surface including a plurality of concentric annular grooves,

c. the ground surface being in the form of a first thin sheet of conductive, permanent marking material positioned on the insulative surface between the disk and the insulative surface,

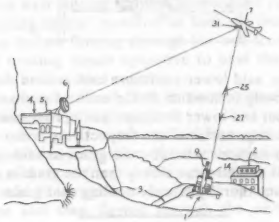
d. a second sheet of plain paper positioned between the bottom of the disk and the sheet of conductive, permanent marking material whereby a permanent graph is left on the plain paper showing the path of movement of the disk.

3,955,292

APPARATUS FOR ANTIAIRCRAFT GUNNERY PRACTICE WITH LASER EMISSIONS

Hans R. Robertsson, Molndal, Sweden, assignor to Saab-Scania Aktiebolag, Linkoping, Sweden

Filed Nov. 18, 1974, Ser. No. 524,826
Claims priority, application Sweden, Nov. 19, 1973, 7315588
Int. Cl.² F41C 27/00
U.S. Cl. 35—25 **9 Claims**



1. In apparatus for controlling the aiming of an antiaircraft weapon having a barrel axis and a firing mechanism, and which apparatus comprises target tracking means located at a distance from the weapon for producing outputs corresponding to the instantaneous position of a target and to its speed and direction of motion, projectile flight time means for producing an output corresponding to the calculated time required for a projectile fired from the weapon to traverse the distance from it to the target, aim calculation means having an input connection from said target tracking means and normally having an input connection from said projectile flight time means, for calculating an aiming-off point ahead of the target at which the weapon should be aimed in order for a projectile fired from it to strike the target, and servo means at the weapon, connected with the aim calculation means and by which the weapon is aimed, means for scoring firing preparation and the accuracy of tracking during simulated firing of the weapon, the last mentioned means comprising:

A. laser means at the weapon for emitting radiation pulses along an axis substantially coinciding with the barrel axis;

B. means at the weapon connected with its firing mechanism and with said laser means, for causing the laser means to emit a pulse train comprising a predetermined succession of pulses of radiation each time the firing mechanism is actuated for the simulated firing of a projectile, each said pulse train containing a predetermined number of pulses and having a duration substantially shorter than the normal time between successive firings of real projectiles;

C. radiation detection means at the weapon for detecting emitted radiation reflected back along said axis from reflector means on a target;

D. means for producing a perceptible scoring output in response to reception by said radiation detection means

of a succession of pulses comprising a predetermined substantial portion of the pulses of a pulse train;

E. manually controllable means by which said aim calculation means can be

1. disconnected from the projectile flight time means, and
2. connected instead, for simulated firing, with a source of an input that corresponds to a projectile flight time equal to zero, so that proper preparation and tracking causes the weapon to be aimed directly at a tracked target at each instant of simulated firing and thus enables the radiation detection means to receive substantially the entire train of pulses emitted at each simulated firing and reflected back from the target.

3,955,293

CONVERTIBLE FOOTWEAR AND ACCESSORIES IN ACCORD

Melvin A. Benedict, 1228 Long Run Road, McKeesport, Pa. 15131

Filed May 20, 1974, Ser. No. 471,680
Int. Cl.² A43B *00/00*
U.S. Cl. 36—2.5 C 2 Claims

1. In combination with a shoe, a removable veneer or cap for changing and enhancing the appearance of the shoe comprising:

a. a generally concave central portion to conform to and cover a portion of the shoe,

b. opposed edge portions which are resilient and frictionally engage and grip welt portions of the shoe when the cap is mounted on the shoe without piercing any portion of said shoe thus providing the sole means of holding the caps onto the shoe, said opposed edge portions permitting ready removal of the cap from the shoe thus restoring the original appearance of the shoe, and

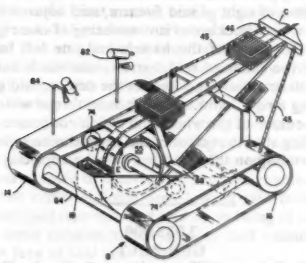
c. an edge portion extending between said opposed edge portions overlaying the upper of said shoe but unconnected thereto to permit movement between said cap and the shoe during flexing of the shoe as occurs during walking.

3,955,294

ELEVATOR APPARATUS FOR TOWED DEEP-SEA PARTICLE HARVESTER

Maurice E. Morgenstein, Kaneohe, Hawaii, assignor to Hawaii Marine Research, Inc., Kaneohe, Hawaii

Filed Feb. 10, 1975, Ser. No. 548,483
Int. Cl.² E02F *3/14*
U.S. Cl. 37—69 12 Claims



1. An elevator apparatus for elevating harvested deepsea particles from an ocean bottom collection point to a surface vessel comprising: a strip extending between said surface vessel and said ocean bottom collection point angularly down to the ocean floor; means for maintaining said strip under tension between said collection point and said surface vessel; said strip including and defining thereon a first and a second railway; a series of sequentially conveyed buckets for movement to said collection point from said vessel along said first railway and movement from said collection point to said vessel along said second railway; means for confining said sequentially conveyed buckets to ride on said first or second railways; means for loading said sequentially conveyed buckets at said collection point; and, means for emptying said sequentially conveyed buckets at said vessel.

3,955,295

DATA BEARING CARD HAVING AN AESTHETIC, MAGNETIZABLE, COLORLESS, TRANSPARENT COATING THEREON

Simon Ernest Mayer, Lexington, Mass., assignor to Roberta B. Kuhns, Lincoln, Mass.

Division of Ser. No. 407,637, Oct. 18, 1973, Pat. No. 3,922,430. This application Aug. 1, 1975, Ser. No. 601,107
Int. Cl.² G09F *3/00;* H01F *10/02*
U.S. Cl. 40—2.2 5 Claims

1. A magnetizable, transparent, colorless coating composition, comprising:

a. a transparent, colorless plastic matrix having an index of refraction from about 1.3 to about 1.6; and,

b. from about 10% to about 60% by weight of a particulate, crystalline, dispersed phase, said crystalline dispersed phase having an index of refraction which matches that of said plastic and which consists essentially of a crystalline reaction product from: (1) about 20% to about 60% of a compound containing a colorless ferromagnetic atom; (2) about 0.1% to about 5% of a refractory metal oxide selected from titanium dioxide, zirconium oxide, and a mixture of both; (3) about 0.05% to about 2.5% of an inorganic fluoride salt; and, (4) a balance of up to 100 weight percent of a glass forming matrix.

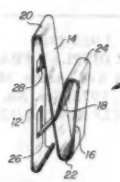
5. A data bearing card comprising a plastic substrate with a photograph thereon, said photograph being overcoated with an optically transparent plastic sheet bonded to said photographic print, and a magnetizable coating of claim 1 on said optically transparent plastic sheet and overlaying said photograph.

3,955,296

CLIP FOR SECURING SIGNAGE TO A VARIETY OF SUPPORTS

Odd B. Kapstad, 5 Minot Ave., Acton, Mass. 01720

Filed Dec. 23, 1974, Ser. No. 535,398
Int. Cl.² G09F *3/18*
U.S. Cl. 40—11 R 8 Claims



1. A clip for securing signage to a support, comprising resilient sheet material formed continuously into generally-planar attaching, connecting, release and gripping members, the attaching member having a dimension suitable for resilient insertion into a display channel and having means for mounting the clip on rod-like supports and said attaching member terminating in a first reverse bend from which the connecting member extends at an acute angle with said attaching member, said connecting member terminating in a second reverse bend from which the release member extends at an acute angle with said connecting member, said release member terminating in a third reverse bend from which the gripping

member extends at an acute angle with said release member towards said connecting member, the terminating edge of said gripping member coacting with said connecting member to provide releasable securing means whereby signage can be inserted or removed from the clip by compressing said release member toward said connecting member and whereby inserted signage is secured by said clip when said compression is removed.

3,955,297

DEVICE FOR ANIMATING AN IMAGE

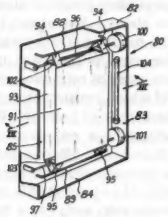
Riant de la Chauviniére, nee Chantal, 167 bis, Ave. V. Hugo, and Francois de la Chauviniére, 88, Ave. Henri Martin, both of 75116, Paris, France

Filed Feb. 19, 1974, Ser. No. 443,841

Claims priority, application France, Feb. 22, 1973, 73.06237

Int. Cl.² G09F *11/21*

U.S. Cl. 40—106.53 **4 Claims**



1. An image animation device which comprises a frame containing a front and a back which are fixed, said front being at least partially transparent, means in said frame for disposing at least three sheets, one behind the other in spaced relation, said sheets including transparent elements and opaque elements, the sheets being joined together in accordion fashion, disposed one behind the other, with vertical joints and movable to permit transverse modification of the spacing therebetween, means in said frame operable at intervals of time in the range of 0.1 seconds to 10 seconds to modify transversally the relative spacing of at least two sheets in relation one to another by movement of said sheets conjointly in accordion fashion with front and rear displacement of the vertical joints, and at least one fixed luminous source arranged laterally of said sheets and operable to illuminate frontwardly at least one of said three sheets.

3,955,298

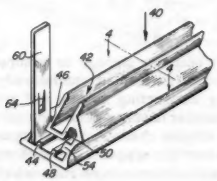
POSTER DISPLAY FRAME

Odd B. Kapstad, 5 Minot Ave., Acton, Mass. 01720

Filed Jan. 31, 1975, Ser. No. 545,950

Int. Cl.² G09F *01/12*

U.S. Cl. 40—152 **7 Claims**



1. A frame for displaying a poster or the like, comprising, in combination, a plurality of frame members joined to each other, each of said frame members having inner, outer and side walls which define a hollow cavity extending therethrough, said frame members also having a U-shaped holder positioned on the exterior of the inner frame wall into which one edge of a poster or the like can be inserted, the base of said U-shaped member extending through the inner frame wall and terminating at the inner side of said hollow cavity, said hollow cavity also containing first guide means and second guide means defining therebetween a slot for receiving one leg of an L-shaped angle joiner having raised tongues on one side thereof, said first guide means being a shoulder extending into said cavity from the inner surface of said outer frame wall and a side of said base of the U-shaped holder where said holder extends into said hollow cavity, said shoulder and base having colinear surfaces, and said second guide means comprising a shoulder extending along the inner surface of a side wall of said frame, the shoulder extending along the inner surface of said side wall being positioned to cooperate with a raised tongue on said L-shaped angle joiner to tightly secure frame members together when said L-shaped angle joiner is inserted into the slot between said first and said second guide means thereof.

3,955,299

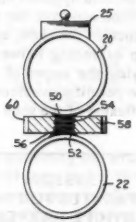
ADJUSTABLE MEANS TO VARY POINT OF IMPACT OF OVER-AND-UNDER FIREARMS

Douglas E. Bullis, Ilion, N.Y., assignor to Remington Arms Company, Inc., Bridgeport, Conn.

Filed Sept. 5, 1974, Ser. No. 503,342

Int. Cl.² F41C *21/06*; F41G *3/00*

U.S. Cl. 42—1 R **12 Claims**



1. In a double-barrel firearm in which an upper barrel is superimposed over a lower barrel, an adjustable means connecting said upper and lower barrels for varying the point of impact of projectile means fired from said lower barrel relative to the line of sight of said firearm, said adjustable means comprising a turn buckle device consisting of one right hand stud fastened to one of the barrels and one left hand stud fastened to the other of said barrels, said studs being held together with an adjusting wheel in the center, said adjusting wheel having a right hand and a left hand thread which terminate at the center of the wheel and which cooperate with the corresponding stud thus causing the barrels to be separated or closed depending on the direction that the adjusting wheel is turned.

3,955,300

GUN BOLT

Lawrence R. Folsom, Williston; Victor R. Gardy, Shelburne; August J. Haberstroh, North Hero; Ettore J. Mancuso, Jr., Essex Junction, and John F. O'Brien, St. Albans, all of Vt., assignors to General Electric Company, Burlington, Vt.

Division of Ser. No. 403,121, Oct. 3, 1973, Pat. No. 3,915,058.

This application Dec. 16, 1974, Ser. No. 533,188

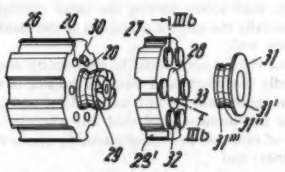
Int. Cl.² F41C *15/02*

U.S. Cl. 42—25 **5 Claims**

1. A gun bolt, for a round of ammunition having an extractor disk, comprising:

a body having a longitudinal axis;
a head, journaled for rotation on said body about said longitudinal axis, and having a transverse bolt face; and
stop means for transversely locating an extractor disk on said bolt face;
said stop means including
a first pair of transversely spaced apart, fixed extractor lugs mutually defining a transverse passageway for an extractor disk;
a second pair of transversely spaced apart elements having a first disposition wherein they are positively projected longitudinally forward from said bolt face into and blocking said passageway and having a second disposition wherein they are positively retracted aftward from said bolt face and clear said passageway;
said first pair of lugs and said second pair of elements when projected forward in conjunction being adapted to transversely surround an extractor disk and to preclude transverse movement of such disk.

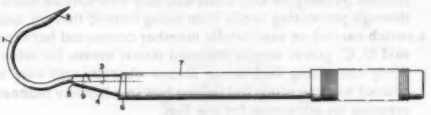
3,955,301
QUICK-LOAD HANDGUN
Günter Wiethoff, Solingen, Germany, assignor to Firma Cuno Melcher KG ME-Sportwaffen, Solingen, Germany
Filed Mar. 29, 1974, Ser. No. 456,253
Claims priority, application Germany, Mar. 30, 1973, 7312072
Int. Cl.² F41C *1/00*; F42B *39/04*
U.S. Cl. 42—59 **5 Claims**



1. A rotatable cylinder for a revolver-type pistol having a barrel adjacent the front end of the cylinder, said cylinder comprising:
a front section formed with a plurality of throughgoing bores alignable on rotation of the cylinder with the barrel;
a rear section formed with a plurality of throughgoing chambers alignable with said bores and each adapted to receive a respective cartridge; and
means for rotationally coupling said sections together and for holding said rear section releasably on said front section, said front section having a rearwardly extending stem and said rear section being a ring surrounding said stem, said ring being formed with a central cylindrical hole and said stem being at least partially cylindrical and snugly receivable within said hole, said stem having a rear face having formations for rotation of said cylinder, said front section having a rear face provided with a rearwardly extending pin constituting part of said means, said rear section having a front face formed with at least one recess adapted to receive said pin, said chambers being of smaller cross-sectional area toward said front end than toward said rear end, and said bores being of substantially the same cross-sectional area as said chambers at the front face of said rear section.

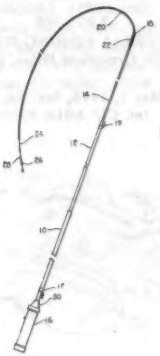
3,955,302
FISHING GAFF
Vincent J. Tudisco, 19 Linwood Ave., Emerson, N.J. 07636
Filed May 8, 1975, Ser. No. 575,516
Int. Cl.² A01K *97/14*
U.S. Cl. 43—6 **3 Claims**

1. In a fishing gaff having a hook with an elongated shaft, a handle comprising a tubular member and a cylindrical supporting member for attaching the hook to the handle, the improvement which comprises: said cylindrical supporting member having (a) a length equal to at least that of the elongated shaft; (b) a channel disposed on its outer surface parallel to the longitudinal axis of the elongated shaft, said channel having (1) a length less than that of the supporting member, (2) a width equal to or less than the o.d. of the shaft and a depth equal to or less than the o.d. of the shaft; (c) means to restrict the length of insertion of the supporting member in



said tubular member; and (d) an o.d. greater than the i.d. of the tubular member, such that when the shaft is inserted in said channel and the supporting member containing said shaft is inserted in said tubular member, axial and rotational movement of the shaft relative to the supporting member and of the supporting member relative to the tubular member are restricted, a portion of the supporting member extends outwardly from the tubular member and is tapered such that at the apex of said portion, the diameter of the supporting member is substantially equal to the o.d. of the elongated shaft.

3,955,303
FISHING ROD
James Raymond Outlaw, Rte. 4, Box 413, Hillsborough, N.C. 27278, and Lewis H. Gardner, 1305 Gardner St., Box 283, Camden, S.C. 29020
Filed Feb. 5, 1975, Ser. No. 547,216
Int. Cl.² A01K *87/00*
U.S. Cl. 43—19.2 **2 Claims**



1. A fishing rod comprising:
a multi-section rod having a central bore extending therethrough with an open end,
a handle member carried by the end of said rod opposite said open end,
a flexible cable extending through said central bore and outwardly from said open end of said bore having a hollow core, said cable having one end received in said handle member,
a rotatable wire carried in said hollow core of said cable extending outwardly from one end of said hollow core, connecting means carried on one end of said wire for connecting a fishing hook and bait thereto, said wire

extending at an end opposite said connecting means, into said handle member,

motor means carried by said handle member having a rotating shaft,

a source of D. C. power connected to said motor means,

means connecting said wire to said rotating shaft for rotation thereby, (and)

said rod including a hollow flexible spring member carried on the end opposite said handle member providing a flexible bushing for said cable and said wire carried therethrough preventing bends from being formed therein, and

a switch carried on said handle member connected between said D. C. power source and said motor means for selectively energizing said motor means whereby said wire is rotated so as to move the fishing bait in a life-like manner creating an attraction for the fish.

3,955,304

FISHING LURE

Robert H. Reid, 297 Bowling Green, Costa Mesa, Calif. 92626

Filed July 28, 1975, Ser. No. 599,377

Int. Cl.² A01K *85/00*

U.S. Cl. 43—42.28 **10 Claims**

1. A fishing lure comprising

an elongated lure body having sides tapering forwardly to form a relatively narrowed nose and having a rounded bottom and a substantially flat top, said body having a leader receiving aperture extending through the length thereof; and a weight in said body between said aperture and said body top.

3,955,305

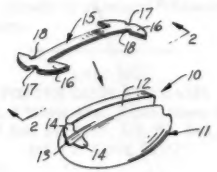
UNIVERSAL FISHING WEIGHT

Earl F. Roberts, 400 Greenfield Drive, Space 119, El Cajon, Calif. 92021

Filed May 1, 1975, Ser. No. 573,417

Int. Cl.² A01K *95/00*

U.S. Cl. 43—44.91 **1 Claim**



1. A Universal Fishing Weight for attachment to a fishing line, comprising in combination, a main body of ovaloid shape, a longitudinal groove on a side of said main body, a narrow recess in a bottom of said groove extending along a longitudinal center of said groove, said narrow recess receiving a fishing line, a transverse groove at each end of said longitudinal groove, a resilient retainer snapably received within said longitudinal and transverse grooves, said retainer including an elongated central portion receivable in said longitudinal groove, and a transverse cross arm portion at each end receivable in said transverse grooves, each said transverse cross arm portion having a notch at each corner where said cross arm portion junctions with said longitudinal portion, a terminal end of each said transverse cross arm portion having a rounded edge and having a notch along a center of said rounded edge, said notches in said corners and on said rounded edge receiving said fishing line wrapped around said cross arm portions.

3,955,306

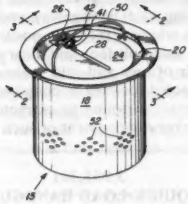
HANDY LIVE BAIT BUCKET

David H. Handa, 4N525 Rte. 83, Bensenville, Ill. 60106

Filed May 27, 1975, Ser. No. 580,615

Int. Cl.² A01K *97/04*

U.S. Cl. 43—56 **8 Claims**



1. A live bait bucket comprising:

a container having a top wall, a bottom and a side wall, said top wall being formed with an access opening therein;

a lid pivotally connected to said container and adapted to releasably close said access opening, said lid being formed with a slot therein;

a scoop mounted in said container for vertical movement therein, said scoop having the same configuration and substantially the same dimensions as the inside surface of said side wall;

a pull rod rigidly connected to said scoop and projecting upwardly therefrom and through the slot in said lid;

abutment means mounted on said pull rod and positioned to engage the underside of said lid, whereby the upward lifting of said pull rod simultaneously opens the lid of the container; and

spring means associated with said top wall and normally urging said lid into the closed position and said scoop into its lowermost position.

3,955,307

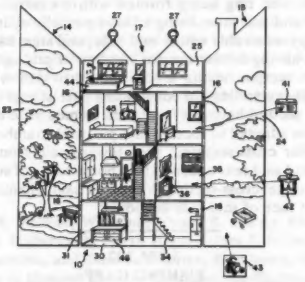
DOLL HOUSE

Jo Ann L. Payton, 416 Jupiter St., Washington Court House, Ohio 43160

Filed Jan. 30, 1974, Ser. No. 437,869

Int. Cl.² A63H *33/00*

U.S. Cl. 46—12 **6 Claims**



1. A doll house comprising

an essentially planar, magnetically responsive member defining a building interior, said surface being printed to illustrate three-dimensionally a plurality of interior rooms of the building,

a plurality of essentially planar, magnetically responsive pieces which are surface-printed so as to illustrate three-dimensionally pieces of furniture, fittings and the like and which are attached magnetically to the surface of said member and arranged at will in the rooms of the doll house to illustrate completed interior rooms, and

further including at least one essentially planar side member hingedly connected to a vertical peripheral edge of said member, said side member being capable of rotating about said hinged connections to extend laterally from and along side of said vertical peripheral edge of said member to uncover and expose said member and to extend, in spaced, parallel relationship, in front of said member, said side member having peripheral edges which describe the outline of an exterior of the building and printing thereon which, in said closed relationship, three-dimensionally illustrates the exterior of said building.

3,955,308

TOY ERECTING KIT

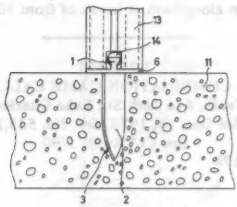
Artur Fischer, Altheimer Strasse 219 D-7241, Tumlingen, Germany

Filed Oct. 9, 1973, Ser. No. 404,602

Claims priority, application Germany, Oct. 28, 1972, 2253081; Dec. 5, 1972, 2255600; Dec. 5, 1972, 2259385

Int. Cl.² A63H *33/00*

U.S. Cl. 46—16 **5 Claims**



1. In a toy erecting kit of the type wherein components of the kit are to be releasably mounted on a base plate, particularly a base plate simulating a landscape, a combination comprising a base of rigid synthetic plastic foam; and connecting means, comprising at least one connecting element having a first portion anchorable in said base plate and configurated as a double-edged knife blade, a second portion provided on said first portion and releasably engageable with a component to be mounted on said base plate, and an abutment located intermediate said first and second portions and arranged to abut said base plate when said first portion is anchored in the same.

3,955,309

STUFFED BENDABLE DOLL

Sid Noble, West Orange, N.J., assignor to Mego Corporation, New York, N.Y.

Filed Nov. 18, 1974, Ser. No. 524,402

Int. Cl.² A63H *3/04, 3/46*

U.S. Cl. 46—151 **11 Claims**

1. A stuffed bendable doll having a head and limbs, said stuffed bendable doll comprising:

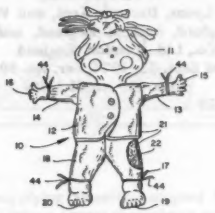
a. an internal frame of a bendable material having a neck element with a connecting element to which said head is rotatably secured and a pair of arm support elements and a pair of leg support elements extending from said neck element providing internal support for said limbs of said doll, each of said pair of arm support elements and each of said pair of leg support elements having an end;

b. a pair of hands;

c. a pair of feet;

d. means for rotatably mounting said pair of hands to said ends of said pair of arm support elements so that each of said ends of said pair of arm support elements has one of said pair of hands rotatably mounted thereon;

e. means for rotatably mounting said pair of feet to said ends of said pair of leg support elements so that each of said ends of said pair of leg support elements has one of said pair of feet rotatably mounted thereon;



f. strengthening means within said internal frame to prevent failure of said internal frame, portions of said strengthening means extending from each of said ends of said pair of arm support elements and said pair of leg support elements, said pair of hands and said pair of feet being secured to said portions to retain said pair of hands on said pair of arm support elements and said pair of feet on said pair of leg support elements;

g. a fabric skin adaped to cover said internal frame; and

h. stuffing material beneath said fabric skin to give said doll consistency.

3,955,310

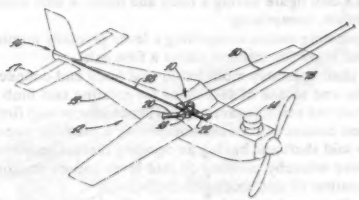
AUTOMATIC CONTROL DEVICE FOR TETHERED MODEL AIRPLANE

Larry H. Renger, Costa Mesa, Calif., assignor to L. M. Cox Manufacturing Co., Inc., Santa Ana, Calif.

Filed Dec. 23, 1974, Ser. No. 535,979

Int. Cl.² B64C *17/04*

U.S. Cl. 46—77 **3 Claims**



1. A control mechanism for a tethered model airplane, said mechanism comprising:

means movably mounted on said airplane for controlling the vertical movement of said airplane;

means responsive to acceleration of said airplane for moving said controlling means;

means for connecting said controlling means and said moving means;

a bell crank movably mounted on said airplane adjacent said moving means and responsive to a control line;

a seating portion attached to said bell crank and having an aperture;

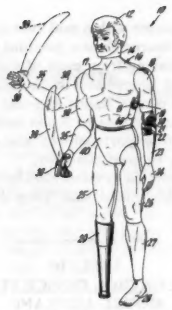
a switching plate rotatably mounted in said aperture, said switching plate having a slot for receipt of one end of said connecting means; and

a switching arm to move said switching plate between two positions, said moving means responsive to said acceleration of said airplane when said switching arm is in one of said two positions, said moving means responsive to said bell crank and said control line when said switching arm is in the other of said two positions.

3,955,311
MECHANISM FOR MOVING AN UPPER APPENDAGE OF A TOY FIGURE

Paul Anthony Lyons, Darenth Kent, and William Frederick Clark, Chingford, both of England, assignors to Lesney Products & Co., Ltd., London, England

Filed Sept. 23, 1974, Ser. No. 508,032
Int. Cl.² A63H *13/04*
U.S. Cl. 46—119 **10 Claims**



7. In a doll figure having a body and limbs, a limb animating mechanism, comprising:

a. operating means comprising a lever pivotally mounted in said body for rotation about a first axis;

b. a shaft rotatably mounted in said body and connected at one end to one of said limbs for rotating said limb about a second axis substantially perpendicular to said first axis;

c. and connecting means comprising a member connected to said shaft and having an opening therein receiving said lever whereby pivoting of said lever causes concomitant rotation of said shaft;

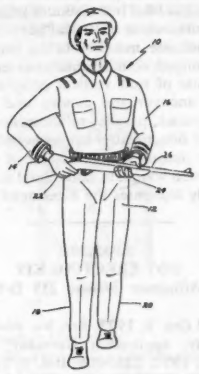
said body comprising at least two segments, a member having a cup-shaped upper portion and an inverted cup-shaped lower portion, and a socket in each of said segments engaging a respective one of said cup-shaped portions to provide a universal connection between said segments.

3,955,312
GRIPPING HAND FOR DOLLS

William A. G. Pugh, Leicester, England, assignor to General Mills Fun Group, Inc., Minneapolis, Minn.

Filed Oct. 17, 1974, Ser. No. 515,742
Int. Cl.² A63H *3/46*
U.S. Cl. 46—163 **11 Claims**

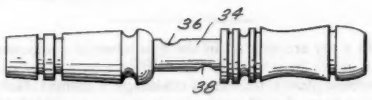
1. A toy figure comprising a body, at least one extremity, means for attaching said extremity to said body, said extremity being prehensile in nature and formed of a plastic material having a Shore A hardness of from 35 to 70; a Lupke resilience of from 55 to 75; a tensile strength of from 40 to 120 kg/cm²; and an elongation at break of from 400 to 750.



3,955,313
COMBINATION GAME CALL

Paul Dudley Faulk, 616 18th St., Lake Charles, La. 70601

Filed Dec. 16, 1974, Ser. No. 533,165
Int. Cl.² A63H *5/00*
U.S. Cl. 46—178 **11 Claims**



1. A combination animal or fowl call device comprising wall means having two ends and defining a central sound chamber, mouthpiece means located at each end of said wall means and including a passageway connected to said chamber, air-responsive sounding means in each passageway, and a plurality of aperture means located in said wall means for controlling the passage of air through said cell device to produce the desired animal or fowl sound.

3,955,314
INFANT'S TOY

Sidney W. Robb, Maplewood, N.J., assignor to The Raymond Lee Organization Inc., a part interest

Filed July 21, 1975, Ser. No. 597,640
Int. Cl.² A63H *5/00*
U.S. Cl. 46—193 **5 Claims**

1. An infant's toy, comprising:

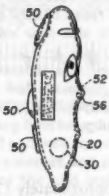
a body shaped like the head of a person, said body being hollow;

a movable element located inside the body, said element being sufficiently smaller than the hollow to rattle therein when the body is shaken;

a perfumed substance located on the outside of the body at

approximately the location of the nose; and

a plurality of differently textured regions disposed on the



outer rear and side surfaces of the body, each region having a distinctive tactile texture.

3,955,315

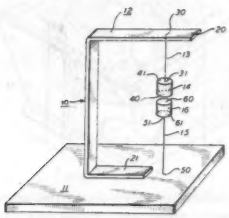
NOVELTY ARTICLE

Gregory L. Goodman, 39 Grandview Terrace, Tenafly, N.J. 07670

Filed Jan. 20, 1975, Ser. No. 542,162

Int. Cl.² A63H *33/26*

U.S. Cl. 46—238 **2 Claims**



1. A novelty article comprising:

a. frame means including an upper portion and a lower portion;

b. a first line secured at one end to the upper portion of the frame means;

c. a first magnet secured to the other end of the first line, and magnetized so that opposite faces define poles of opposite polarity;

d. a second line secured at one end to the lower portion of the frame means;

e. a second magnet secured to the other end of the second line, and magnetized so that opposite faces define poles of opposite polarity, in which the first and second magnets are oriented with respect to each other so that the poles of the first and second magnets which are facing each other are of opposite polarity so that the first and second magnets attract each other when the second magnet is positioned proximate to the first magnet, and in which the length of the second line is such that the second magnet is restrained from contacting the first magnet when the second line is fully extended upon positioning the second magnet proximate to the first magnet; and

f. said first and second lines being freely flexible, whereby the first and second magnets are freely movable with the first and second lines to which they are secured, on moving at least one of said so freely flexible lines and magnet so secured thereto.

3,955,316

POWER SUPPLY FOR MODEL WATERCRAFT

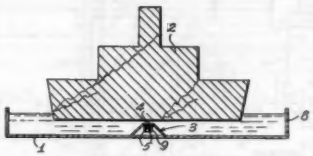
Adalbert Drossbach, Finkenstrasse 14, 2150 Buxtehude, Germany

Filed July 5, 1974, Ser. No. 486,170

Claims priority, application Germany, July 5, 1973, 2334215

Int. Cl.² A63H *23/04*

U.S. Cl. 46—250 **11 Claims**



1. A power supplying assembly adapted for conducting electrical current from a source thereof to a model watercraft being propelled on the surface of a liquid contained in a vessel, comprising a generally hollow body adapted for placement below said liquid surface, said body defining at least one air chamber therein having access means for an electrical contact member associated with said craft, means for supporting said body on the bottom of the vessel containing said liquid and at least one electrical conductor contained within said air chamber, said air chamber being bounded by at least one lip member depending downwardly from the top surface of said body, whereby access to said electrical conductor is made by the electrical contact member passing under said lip.

3,955,317

METHOD OF GROWING PLANT CELLS

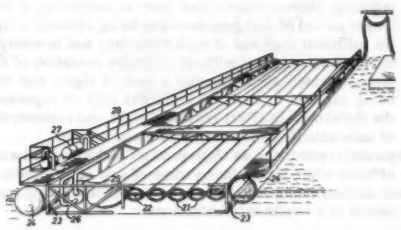
Claude Gudin, Palette, France, assignor to The British Petroleum Company Limited, London, England

Filed Jan. 27, 1975, Ser. No. 544,361

Claims priority, application United Kingdom, Jan. 28, 1974, 3806/74

Int. Cl.² A01G *31/00*

U.S. Cl. 47—1.2 **6 Claims**



1. A method for growing plant cells containing chloroplasts in liquid suspension simultaneously with the growth of photosynthetic bacteria, in which method the liquid suspension containing the plant cells is enclosed in a first elongated, at least partially transparent, container and a liquid suspension of photosynthetic bacteria is contained in second elongated, at least partially transparent, container, the said second container being attached to the said first container so that light passing through the said first container then passes through the said second container; the said containers preventing passage of liquid from one container to the other, the containers being supported on a body of water; the liquid suspension in the first container being exposed to light and brought into contact with carbon dioxide.

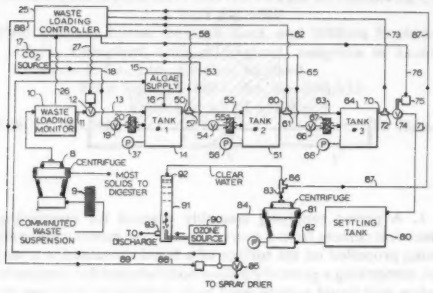
3,955,318
WASTE PURIFICATION SYSTEM

John Robin Hulls, Mill Valley, Calif., assignor to Bio-Kinetics Inc., San Rafael, Calif.

Continuation of Ser. No. 342,516, March 19, 1973, abandoned, which is a continuation-in-part of Ser. No. 205,152, Dec. 6, 1971, abandoned. This application Mar. 5, 1975, Ser. No. 555,458

Int. Cl.² A01G 7/00; C02C 1/02

U.S. Cl. 47—1.4 **40 Claims**



1. A method of growing substantially unicellular algae and simultaneously purifying biodegradable waste material containing aerobic bacteria, such as sewage after comminution and after removal of most particulate matter, including non-biodegradable matter and after being largely freed from turbidity so that light can effectively penetrate thereinto, to provide a clean water, comprising:

preparing an aqueous admixture of said algae and said waste material,

said waste material providing nitrogen and phosphorous nutrients for said algae and being admixed in an amount to support growth thereof,

aerating and agitating said admixture and supplying it with carbon dioxide and air in an amount that balances the bacterial growth with the algal growth to keep them in approximately the same relative proportions,

circulating the agitated admixture in a series of many cycles where it is exposed at each cycle for a period of about one-half second to about two seconds to light capable of inducing photosynthesis and then is subjecting it to a longer period of darkness the algae being exposed to light for sufficient time and of such frequency and intensity to effect photosynthesis without excessive oxidation of thylakoids, which are inherently a part of algae, and then being exposed to dark for sufficient time to regenerate the thylakoids, to effect growth of algae and consumption of substantially all of said waste material, and

separately recovering an algae product and a purified water effluent while recirculating some of said algae product.

said method being continuous, said admixture being maintained in a continuous culture state.

3,955,319
HORTICULTURAL SHEET MULCH

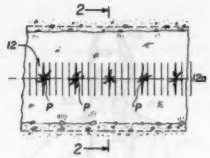
Norman J. Smith, 1655 Junior Drive, Vineland, N.J. 08360

Continuation of Ser. No. 460,746, April 15, 1974, abandoned, which is a continuation-in-part of Ser. No. 293,661, Sept. 29, 1972, abandoned. This application Apr. 14, 1975, Ser. No. 567,933

Int. Cl.² A01G 1/00; A01C 1/04

U.S. Cl. 47—9 **18 Claims**

17. An article of manufacture comprising a thin mulching film of synthetic material for covering soil in which plants are to be grown and for enhancing the growth of such plants in the soil by increasing the temperature and keeping moisture retained therein, and having a plurality of parallel lines of spaced linear slits cut thereinto, and wherein the length of the linear slits is approximately 125 mm. and the spacing therebetween in each line is approximately 125 mm., and the spacing between lines is approximately 25 mm.



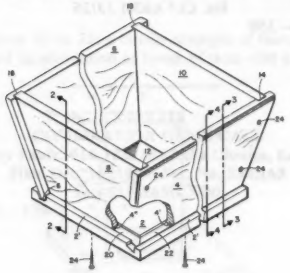
3,955,320
PLANTER BOX

Walter Serovy, deceased, late of Bel Air, Md., by Herbert J. Arnold, administrator, W. R. Grace Bldg., Baltimore, Md. 21203

Filed Apr. 8, 1974, Ser. No. 458,761

Int. Cl.² A01G 9/02; B65D 9/06, 9/12, 9/34

U.S. Cl. 47—34 R **3 Claims**



1. An open top planter box comprising:

a. a rectangular wooden bottom base member having upper and bottom surfaces, four open grooves extending along its upper surface, two of said grooves extending adjacent two opposite side edges and two of the said grooves extending adjacent two opposite end edges, the side wall grooves adjacent the two side edges extending the full length of the bottom base member between opposite end edges and the end wall grooves extending along the end edges of the bottom base member having their respective ends terminating into each of said side wall grooves, each groove in the bottom base member formed with a flat bottom surface and two lateral side surfaces each of which is perpendicular to the flat bottom surface of each respective groove, the flat bottom surface of each groove being angled downwardly toward the bottom surface with respect to the edges of the bottom base member;

b. A pair of wooden side wall members and a pair of trapezoidal wooden end wall members, each of the side wall members and each of the end wall members having parallel side surfaces, top and bottom edges, and lateral side edges, all of the said side and said end wall members being of substantially the same height and thickness, at least the bottom edges of the side wall and end wall members being perpendicular to the parallel side surfaces of the respective side wall and end wall members;

c. At each lateral side of each of the side wall members an open groove extending inwardly from the edge thereof is provided having a flat bottom surface and two lateral parallel side surfaces the bottom surface of each wall

groove being parallel and registering with the respective lateral side edge of each end wall member, the lower ends of the grooves in the side wall members registering with respective end wall grooves in the base member;

d. The two lateral side surfaces of the grooves in the bottom base member being spaced apart to slidably receive the bottom edges of the said side wall and said end wall members;

e. The two lateral parallel side surfaces of each of the grooves in the side wall members receiving a respective end wall lateral side edge therein; and

f. The planter box being held together by means for retaining the side wall and end wall members within the grooves in the bottom base member and means for retaining the lateral side edges of the end wall members within the grooves of the side wall members.

3,955,321

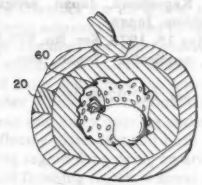
PROCESS FOR GROWING NOVEL PLANTS

Ralph R. Payton, Carmel Valley, Calif., assignor to The Raymond Lee Organization Inc., a part interest

Filed Feb. 18, 1975, Ser. No. 550,648

Int. Cl.² A01G *1/06*; A01B *79/00*

U.S. Cl. 47—58 **1 Claim**



1. A process for introducing foreign bodies into the interior of pumpkins and like living plant fruits, comprising:

extracting a plug from the wall of the growing fruit when the fruit is in an immature stage of growth on its vine;

inserting an empty plastic bag into the interior of the fruit, leaving the open end of the bag outside;

placing the foreign bodies into the bag;

tying the open end of the bag;

pushing the tied end of the bag into the interior of the fruit;

replacing the plug in the wall of the fruit; and

allowing the fruit to grow to a mature ripe stage of development and thus allowing the plug to reunite itself to the wall of the plant.

3,955,322

ENTRY LOCK

Charles W. Call, Jr., 52 Springbrook Road, Morristown, N.J. 07960

Filed July 2, 1973, Ser. No. 376,041

Int. Cl.² E06B *3/34*, *5/00*

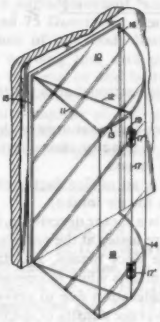
U.S. Cl. 49—40 **4 Claims**

1. Entry lock for controlled ingress and egress comprising:

a. means defining a door opening;

b. first and second door means spaced apart from each other and adapted to swing together about a common axis positioned at a side of the door opening into alternate register therewith; and

c. third door means hingedly attached approximate the outside edge of the first or second door means and latched approximate the outside edge of the other of said first or second door means forming a confined area in conjunction with said first and second door means and preventing ingress and egress through said door opening



when said first and second door means swing together into alternate register with the door opening.

3,955,323

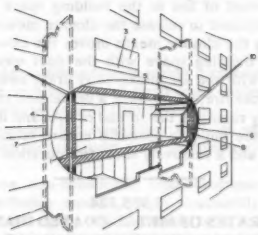
MEANS FOR RETARDING THE SPREAD OF FIRE FROM A BUILDING SPACE

Tibor Z. Harmathy, Ottawa, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Filed June 4, 1975, Ser. No. 583,519

Int. Cl.² F24F *7/06*

U.S. Cl. 52—1 **7 Claims**



1. Means for retarding the spread of fire from a building space, having air intake thereto, comprising:

a. upwardly extending duct means having poor heat transmitting walls, for connecting the building space to the outside atmosphere,

b. closure means, tightly closing and thermally insulating the building space from the duct means,

c. means urging the closure means to open and thereby establish connection between the building space and the duct means,

d. securing means, releasably securing the closure means in the closed position, and wherein

e. for most effective operation, the following two conditions are satisfied, relying on the state of the art:

$$\frac{A_C}{A_D} \leq \frac{1}{1.163\psi\delta}\left\{\frac{1}{2\alpha}\frac{\rho_d}{\rho_a}\left[g(\rho_a-\rho_d)\frac{H_1-z}{p_e-p}-\frac{p_a-p}{p_e-p}\right]\right\}^{\frac{1}{2}}$$

and

$$\frac{A_C\delta\left[2\rho_a(p_e-p)\right]^{\frac{1}{2}}}{C\phi G} > 1$$

where

A_C (m^2) is the cross-sectional area for the air intake to the building space,

A_D (m^2) is the cross-sectional area of the duct means,

ψ (dimensionless) is a factor characteristic of the airtightness of the duct means,

δ (dimensionless) is an orifice factor characteristic of the sizes of the area for air intake,

α (dimensionless) is a factor describing, in terms of velocity head, the pressure losses at the entry and exit of fire gases to and from the duct means, and the frictional losses within the duct means when in operation,

g (m/s^2) is the acceleration due to gravity,

ρ_d (kg/m^3) is the average density of the fire gases in the duct means when in operation,

ρ_e (kg/m^3) is the density of air in the space from which it enters the building space when on fire,

ρ_a (kg/m^3) is the density of the outside atmosphere,

H_1 (m) is the height of the duct means,

z (m) is the elevation of the building space,

p_e ($kg/m\ s^2$) is the pressure of the space from which the bulk of air enters the building space,

p_a ($kg/m\ s^2$) is the pressure of the outside atmosphere,

p ($kg/m\ s^2$) is the desired pressure in the building space which, for correct operation in fire, is equal to or lower than the pressure in any adjoining space to be protected from the penetration of flames and fire gases,

C ($kg/m^2\ s$) is a constant characteristic of the combustible materials in the building space,

ϕ (m^2/kg) is the specific surface of the combustible materials, and

G (kg) is the total mass of the combustible materials in the building space, whereby

f. in the event of fire in the building space the securing means are actuated to release the closure means, so that the means urging the closure means moves the closure means to connect the building space with the duct means acting in conjunction with the air intake to i) drain away flames and smoke from the fire, ii) produce a depression in the building space thereby retarding the spread of fire, and iii) draw sufficient air to the building space to ensure relatively low fire temperature and a relatively short fire duration.

3,955,324

AGGLOMERATES OF METAL-COATED DIAMONDS IN A CONTINUOUS SYNTHETIC RESINOUS PHASE

Olle B. Lindstrom, Lorensviksvagen 14, Vigbyholm, S-183 63 Taby, Sweden

Continuation of Ser. No. 875,405, Oct. 10, 1965, abandoned. This application Dec. 11, 1973, Ser. No. 423,775

Int. Cl.² C09K *3/14*

U.S. Cl. 51—298 R **13 Claims**

1. A grinding tool having an inactive part and an active part, said active part comprising a synthetic resin material having properties suitable for grinding tools in which a layer of distinct abrasive particles are embedded, each of said abrasive particles when not exposed through said surface layer being completely surrounded by said plastic resin and consisting solely of a binder of a metal possessing good heat conducting ability, strength and elasticity properties and at least two abrading grains embedded therein, wherein at least one abrading grain is a diamond and wherein each abrading grain when not exposed through said surface layer is completely surrounded by said metal binder, wherein:

the ratio of the volume of the metal to the volume of the abrading grains in the abrasive particles falls within the range of from 1:4 to 20:1,

the ratio of the volume of said abrasive particles to the volume of said resin falls within the range of from 1:3 to 20:1,

the abrading grains are of a size as measured in the longest tip-to-tip direction that falls within the range of from 0.037 mm to 0.350 mm, and

the abrasive particles are of a size as measured in the longest tip-to-tip direction that falls within the range of from 0.2 mm to 1 mm.

3,955,325

ABRADING APPARATUS FOR THE HOUSING OF A ROTARY ENGINE

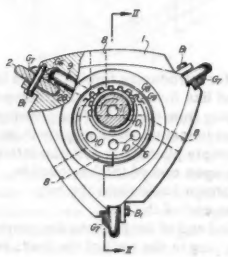
Hatsuo Uchikoba, Kagoshima, Japan, assignor to Sayoko Uchikoba, Kagoshima, Japan

Filed May 15, 1975, Ser. No. 577,591

Claims priority, application Japan, Dec. 20, 1974, 49-146523

Int. Cl.² B24B *19/08*

U.S. Cl. 51—90 **1 Claim**



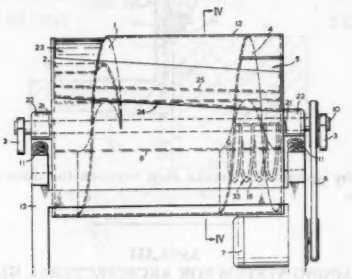
1. An abrading apparatus for the housing of a rotary engine formed therein with a cavity in which a rotor piston having a plurality of vertexes is adapted to revolve along a predetermined path while being maintained in sliding contact with an inner peripheral wall of the housing said abrading apparatus being characterized by comprising a cutter support member (1) formed therein with a plurality of vertexes and adapted to revolve along a predetermined path in the cavity (31), cutters (2) each mounted at one of said vertexes of said cutter support member (1) to effect abrading of the inner peripheral wall (34, 35) of the housing (30), a first drive shaft (D_1) mounting thereon an eccentric cam (6) for causing said cutter support member (1) to revolve along said predetermined path, and a second drive shaft (D_2) mounted for rotation about the same center axis of rotation as the first drive shaft (D_1) for causing said cutters (2) to rotate.

3,955,326

FINISHING MACHINE

Eric Francis Smith, Wembley, England, assignor to Fox Chemical & Engineering Limited, London, England

Filed Mar. 17, 1975, Ser. No. 558,812
Int. Cl.² B24B *31/00*
U.S. Cl. 51—163 R 13 Claims



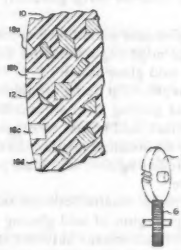
1. A finishing machine comprising a finishing chamber; resilient means mounting said finishing chamber for vibratory motion about a substantially horizontal axis; an entry opening in said finishing chamber for an article to be finished, said entry opening being adjacent one end of said chamber; an exit opening in said chamber for the finished article, said exit opening being adjacent the other end of said container and laterally spaced from and above the entrance opening; said finishing chamber having an intermediate finishing region disposed between said entry opening and said exit opening, a spiral entry deflector plate adjacent both said entry opening and said finishing region for guiding an article and a finishing medium into said finishing region; a spiral exit deflector plate adjacent both said exit opening and said finishing region for guiding an article and a finishing medium from said finishing region to said exit opening; said finishing region being in the form of an annular, tubular passage extending between said deflector plates; and means connecting said exit opening to said entry opening so that the finishing medium can be recirculated and the finished article collected.

3,955,327

GEAR POLISHING

Melvin A. Franco, Detroit, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Dec. 21, 1972, Ser. No. 317,109
Int. Cl.² E05D *15/40*
U.S. Cl. 51—206 R 27 Claims



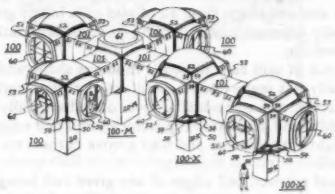
1. A polishing tool for use with a polishing compound having polishing particles therein the majority of which are substantially smaller than 50 mesh, said tool comprising a body having at least a portion thereof having a polishing surface, said body portion being formed essentially of a relatively soft or yieldable highly resilient solid material characterized by the fact that the material is in the form of a solid continuum having a multiplicity of discrete solid particles of at least 50 mesh particle size uniformly distributed therein and the complete absence of voids therein and being devoid of abrasive grit bonded to the surface thereof, said material having a hardness of between 75 Durometer A and 55 Durometer D, the polishing surface of said body having a multiplicity of pores or recesses opening into said polishing surface and extending into the material of said body portion, said pores resulting from the elimination of the discrete solid particles from the surface, the majority of said pores or recesses conforming in size to particles of 50 mesh or larger to provide for physical reception therein of particles of polishing compound.

3,955,328

MODULAR BUILDING SYSTEM

Jeffrey Lindsay, 420 Amapola Lane, Los Angeles, Calif. 90024

Continuation-in-part of Ser. No. 142,219, May 11, 1971, abandoned. This application Jan. 25, 1974, Ser. No. 436,733
Int. Cl.² E04B *1/32, 5/43*
U.S. Cl. 52—73 11 Claims



1. A modular building system which comprises:

at least two individual room-sized space enclosing modules individually secured to foundations;

structural means for supporting each of said individual foundation secured room-sized modules above their foundations;

at least one non-collapsible rigid, clearspan room-sized space-enclosing module which structurally bridges between, and is rigidly interconnected to, at least two of said foundation secured individual room-sized modules, each of said clearspan modules being completely supported by at least two of the said foundation secured individual room-sized modules and by said structural means therefor,

each of said individual room-sized space-enclosing modules being defined by a rigid space-enclosing shell, said rigid shell of each of said individual room-sized modules comprising a plurality of prefabricated molded plastic sections, the shapes of said sections being derived from the geometry of a spherical square;

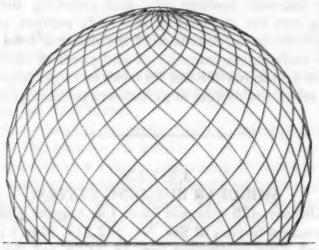
said structural means for supporting each of said individual foundation secured room-sized modules above their foundations, extending upwardly and outwardly with respect to their foundations and further extending through said at least one rigid clearspan module; and

a floor supported upon said structural means which defines a space both above and below said floor within the rigid shell of the individual room-sized modules.

3,955,329
HOLLOW STRUCTURE

Wayne A. Hannula, 190 Flagg Road, Hubbardston, Mass. 01542

Filed May 3, 1974, Ser. No. 466,607
Int. Cl.² E04B 1/342; E04C 1/30
U.S. Cl. 52—81 10 Claims



1. A hollow structure having a generally spherical or frustospherical shape comprising:

a. a plurality of superposed circular horizontal rows of interlocked cells, all of said cells in any given horizontal row being identical in size and shape, and being different in size and shape from all of said cells in any given vertically adjacent row according to a specific mathematical formula;

b. each of said cells having a rhombus shape and substantially flat major interior and exterior plate surfaces and having a continuous groove of substantially uniform width and depth running along all four cell edges to form eight plate corners and four groove corners on each said cell;

c. said grooved cell edges of any given cell being lockably inserted into the corresponding grooved cell edges of all given adjacent cells to interlock all of said cells into a unitary structure in such a fashion that said major surfaces of any two horizontally adjacent cells lie in substantially the same plane and said major surfaces of any two vertically adjacent cells lie in different planes, the exterior plate surface of the upper of said two vertically adjacent cells overlapping the exterior plate surface of the lower of said cells;

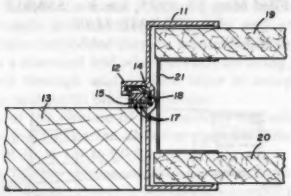
d. each said cell having six of said eight plate corners cut off, excluding the lower exterior corner and the upper interior corner, said cut-offs being substantially perpendicular to their respective rhombus diagonals, said interlocked cells forming a double overlapping seal at each four-cell juncture.

3,955,330
SMOKE STOP FOR DOORS

Alan C. Wendt, Barrington, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed June 25, 1975, Ser. No. 590,365
Int. Cl.² E04H 9/00
U.S. Cl. 52—204 8 Claims

1. A smoke stop for doors comprising: a metal frame with a slot therein extending along substantially the entire length of the frame on the door side thereof; a continuous tube disposed within the slot, said continuous tube having retarded decomposability at the kindling temperature of the door and said continuous tube having one or more fins running the entire length thereof and projecting outward on the door side of the frame; and an intumescent material completely enclosed within the continuous tube, whereby when the door is closed and the frame is subjected to flames, the intumescent material expands causing one or more of the fins on the tube to enter into contact engagement with the door along an edge thereof

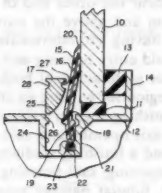


thereby providing a smoke stop between the door and the frame.

3,955,331
RETAINING SYSTEM FOR ARCHITECTURAL GLAZING STRIP

Fred Williams, Pittsford, N.Y., assignor to Schlegel Corporation, Rochester, N.Y.

Filed Sept. 3, 1974, Ser. No. 502,795
Int. Cl.² E06B 3/62
U.S. Cl. 52—397 3 Claims



1. A retaining system for an architectural glazing strip having a longitudinally extending spring material encased in an elastomeric material to extend laterally from an anchorage edge region of said strip to a glass-engaging edge region of said strip, said retaining system comprising:

a. anchorage means for securing said anchorage edge region in place around the periphery of a glass panel so said glass-engaging edge region is cantilevered outward from said anchorage means for pressing against said glass panel;

b. a length of a retainer strip generally wedge-shaped in cross section;

c. said anchorage means including a recess extending along said anchorage edge region on the side of said glazing strip opposite said glass panel;

d. said wedge-shaped strip being configured relative to said recess and said glazing strip so said wedge-shaped strip can be driven into said recess to support said anchorage edge region in an installed position so said glass-engaging edge region presses against said glass panel with a predetermined force;

e. a first interference means between said recess and said anchorage edge region of said glazing strip;

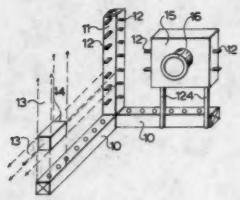
f. a second interference means between said recess and said wedge-shaped strip for retaining said wedge-shaped strip in said recess; and

g. said second interference means including detent means on said recess and on said anchorage edge region, and corresponding detent means on each side of said wedge-shaped strip.

3,955,332
METHOD OF BUILDING A STRUCTURE FROM BRICKS AND MORTAR

Gerhard Genis, Portion A 3431/11, 10 Putfontein, District Benoni, South Africa

Filed Dec. 3, 1973, Ser. No. 420,910
Claims priority, application South Africa, Dec. 6, 1972, 72/8638
Int. Cl.² E04G 21/10
U.S. Cl. 52—747 2 Claims

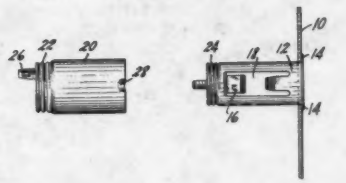


1. A method of building a structure which comprises:
drawing a plan view of the structure,
having pairs of spaced apart parallel lines which indicate pairs of spaced apart parallel vertical surfaces of said structure, the areas between said pairs of lines indicating volumes between said pairs of surfaces which correspond with walls of said structure,
projecting said spaced apart parallel lines at those localities where said projections intersect with other spaced apart parallel lines and with other projections of other spaced apart parallel lines,
said projections of pairs of spaced apart parallel lines defining projections of said pairs of spaced apart parallel vertical surfaces of said structure,
each of said intersections of spaced apart parallel lines defining an area which is common to the areas between the intersecting pairs of lines,
each said common area defining a volume which is common to the volumes between the intersecting pairs of surfaces,
fabricating structural profiles in shapes corresponding to the said common volumes between the pairs of surfaces of said structure and including bonding elements projecting from said profiles,
determining from plan view the locations on the structure site for the respective prefabricated structural profiles and locating said profiles in their respective locations which correspond to the common volumes between the surface projections of said structure,
erecting said located profiles in their respective localities on site so that each structural profile will constitute a composite portion of the structure in place of and in substitution for a plurality of bricks and mortar at the localities of said common volumes,
at least a pair of said profiles having surface portions which define a common surface of said structure and aligning said profile surface portions,
providing a footing which is level and true, between said pair of profiles,
filling at least a space between the pair of profiles with building elements including bricks and mortar by building the bricks up course by course on the footing to form wall sections,
bonding the building elements to the bonding elements by cementing,
aligning the bricks with the surface portions of said profiles which define a common surface of said structure to provide a straight and true wall of said surface,
and leaving the structural profiles built into the erected structure as permanent components thereof,
said pairs of parallel spaced apart lines correspond with primary structures of said walls including bricks, and providing additional pairs of spaced apart parallel lines of said plan view, which additional lines correspond with secondary structure of said walls including plaster, wherein, additionally to said projections of said pairs of lines, hypothetical lines are provided on said plan view, said hypothetical lines intersecting with said projections of said other pairs of hypothetical lines, defining additional volumes,
fabricating structural profiles of plaster in shapes corresponding to the said additional volumes,
locating and erecting said plaster profiles in localities of said structure indicated by the plan and adjacent said wall sections, applying wet plaster to the building elements and smoothing the plaster surface and aligning the same with said plaster profiles by employing said plaster profiles as guides.

3,955,333
CIGAR LIGHTER CLAMP SHELL

Frank J. Fellin, Seymour, Tenn., assignor to Wagner Electric Corporation, Parsippany, N.J.

Filed Mar. 17, 1975, Ser. No. 559,037
Int. Cl.² F16B 7/00
U.S. Cl. 52—758 R 4 Claims



1. In a clamp shell for securing a cigar lighter socket assembly.
a. an essentially cylindrical member having opposed ends;
b. the inside diameter of the cylindrical member being at least about 10% greater than the outside diameter of the cigar lighter socket assembly to be secured;
c. one of said opposed ends having means for threaded engagement with a correspondingly threaded portion of the cigar lighter socket assembly; and
d. the other of said opposed ends having alignment means to reduce the effective diameter of said other opposed end of the cylinder to a dimension no more than 5% greater than the outside diameter of the cigar lighter socket assembly.

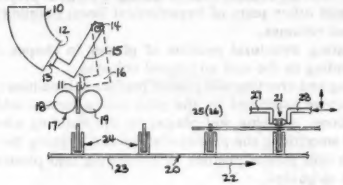
3,955,334
PROCESS AND APPARATUS FOR SUPPLYING POUCH-LIKE CONTAINERS TO A FILLING STATION

Rudolf Wild, Eppelheim; Gerhard Kucherer, Heidelberg, and Friedrich Stumpf, Mechesheim, all of Germany, assignors to Indag Gesellschaft fur Industrieberdarf, Heidelberg, Germany

Filed Mar. 26, 1974, Ser. No. 454,970
Claims priority, application Germany, Mar. 30, 1973, 2315896
Int. Cl.² B65B 43/30, 43/32, 43/22, 43/18
U.S. Cl. 53—29 5 Claims

1. In a method for filling pouches of flexible sheet material, the improvement comprising feeding the pouches from a stack in which the broader sides of adjacent pouches lie next to each other, and during said feeding step forming at least one intermediate crease in the broader sides of the pouches parallel to the longitudinal edges thereof, transferring the creased pouches in upright position in a path towards a filling station with the broader sides of the pouches lying crosswise of the

path while supporting the bottom edges of the pouches, conducting the pouches in said path between spaced rails which decrease in distance from each other thereby pressing the upper ends of the side edges of the pouches during movement



in said path towards each other so as to open the upper ends of the pouches, gripping the opposite surfaces of the broader sides of the pouches suctionally at the filling station and spreading the broader sides apart.

3,955,335

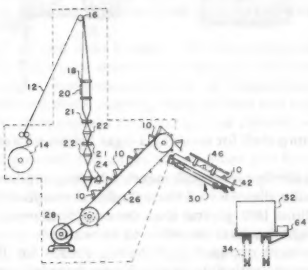
TETRAHEDRON FORMING MACHINE

Robert V. Yates, Jr., Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed Mar. 7, 1975, Ser. No. 556,382

Int. Cl.² B65B *57/06, 57/14*

U.S. Cl. 53—55 **3 Claims**



2. Apparatus for tumbel packing a plurality of articles into a transport container comprising: means supporting a transport container at a container filling station, conveying means operably associated with said means to support a transport container and mounted at a level higher than a transport container to be filled to drop a plurality of articles into the transport container, said conveying means including a slidably mounted chute mounted at a downward angle towards the transport container, means connected to said chute to slide said chute downwardly towards the transport container when it is desired to drop articles into the container and to retract said chute when a pre-determined number of articles have been dropped into the transport container, said chute including a pivotally mounted gate member on the end thereof and means to automatically open said gate member when said chute substantially completes its downward movement.

3,955,336

CARTRIDGE LOADING APPARATUS

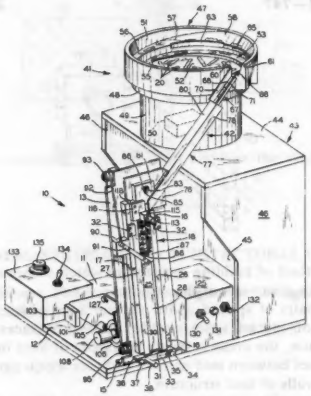
Robert W. Fern, and Robert B. Kimura, both of Toledo, Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Sept. 19, 1974, Ser. No. 507,408

Int. Cl.² B65B *57/10, 5/10*

U.S. Cl. 53—59 R **9 Claims**

1. An apparatus for loading articles into a cartridge comprising: a frame, means on said frame for supporting a cartridge in a generally upright position, said cartridge having an open trough extending lengthwise thereof, means on said frame for guiding generally flat articles into the upper end of said trough, movable means disposed in said trough for supporting said articles in a horizontally stacked relation in said trough up to a predetermined distance from the lower end of said guide means, said guide means having means orienting said articles in a flat attitude during advancement therealong,



said guide means also including means for directing additional articles in the upper end of said trough in a stacked, tilted position resting on said horizontally stacked articles, and means responsive to the upper level of said stacked tilted articles for controlling axial movements of said support means within said trough to change the effective length thereof and maintain the upward level of said horizontally stacked articles on said support means within a predetermined distance from said lower end of said guide means.

3,955,337

APPARATUS FOR MANUFACTURING AND WRAPPING LABELS

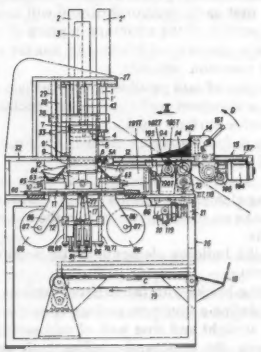
Simon Bleich, 29 Gassergasse, A-1050 Vienna, Austria

Filed June 10, 1975, Ser. No. 585,569

Claims priority, application Austria, June 11, 1974, 4822/74

Int. Cl.² B65B *13/06, 13/32;* **B26D** *5/20*

U.S. Cl. 53—123 **9 Claims**



1. Apparatus for manufacturing labels from a stack of sheets of paper and for wrapping stacks of said labels, comprising a

table for supporting said stack of sheets of paper, severing means comprising blanking means for cutting a stack of blanks from said stack of sheets of paper and punching means for punching a stack of labels from said stack of blanks in the position in which said blanks have been formed, guide means for vertically guiding said labels to wrapping means, said blanking means and punching means, guide means and wrapping means being arranged in said order in a vertical succession adjacent to said table, said table being provided with feeding means, said table and feeding means cooperating to intermittently feed said stack of sheets of paper in a first direction in steps corresponding to a first dimension of each of said blanks toward said means arranged in said vertical succession, and repeatedly feed said stack of sheets in a second direction, which is transverse to said first direction, in steps corresponding to a second dimension of said blanks, so that stacks of blanks are severed in successive rows from said stack of sheets of paper.

3,955,338

APPARATUS FOR FORMING GUSSET PLEATS IN TUBULAR BAGS

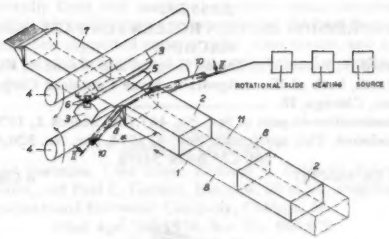
Bruno Winzeler, Lohningen, and Roland Watzka, Langwiesen, both of Switzerland, assignors to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Jan. 22, 1975, Ser. No. 542,891

Claims priority, application Switzerland, Jan. 24, 1974, 993/74

Int. Cl.² B65B *51/20*

U.S. Cl. 53—180 R **10 Claims**



1. Apparatus for forming gusset pleats in tubular packages on a continuously operating packaging machine in which items to be packaged are spaced at uniform intervals within a generally rectangular tube of sealable packaging material, and two oppositely disposed narrow sides of the tube are folded inwardly prior to a transverse seam being formed in the tube between every two items, said apparatus comprising: two nozzles positioned for directing two jets of a gaseous medium toward the oppositely disposed narrow sides of said tube for folding the narrow sidies inwardly; means connected to supply a gaseous medium under pressure to said nozzles; and means supporting said nozzles for movement in a manner to press said nozzles against the narrow sides of the packaging tube during each operating cycle so that said nozzles mechanically produce indentations therein which initiate the forming of the folds by the jets of gaseous medium.

3,955,339

PACKAGE BANDING APPARATUS

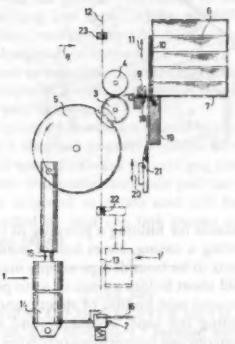
Josef Kiener, and Eugen Lutz, both of Muhlbachstrasse, 8942 Ottobeuren, Germany

Filed June 17, 1974, Ser. No. 480,231

Claims priority, application Germany, June 20, 1973, 2331401

Int. Cl.² B65B *13/02*

U.S. Cl. 53—198 R **3 Claims**



1. In banding apparatus for wrapping a continuous tensioned band about at least one article to form a package, comprising: support means for an article to be banded; means for moving the article in a path along said support means; a pair of supply roller means each carrying a supply of banding material joined to each other by a transverse weld seam, said supply of banding material extending in a path intersecting the path through which said article is moved on the support means, said supply roller means being journaled for free rotation as the banding material is payed therefrom whereby movement of the article on the support surface and through the path intersected by the supply of banding material causes the banding material to be draped about the article being banded; and means for securing the banding material in circumposed, tensioned relation about said article, the improvement in which said last-mentioned means comprises: a pair of rollers disposed transversely in spaced relation relative to the path through which said article is moved at the side of the banding material opposite that toward which the article is moved; means for moving said rollers in juxtaposed relation to substantially pinch the band of material about the article being banded; means for tensioning the band of material draped about the article and pinched by the rollers; means for clamping the band of material while tensioned and retaining it pinched; and means for sealing and severing the band of material while tensioned for forming the continuous band about the article and forming the transverse weld seam in the band for subsequent wrapping operation, said means for tensioning the band of material comprising means for reversing the rotation of one of said rollers, said means including a fluid-pressure-operated, piston-cylinder unit operatively connected to said one roller and adjustable valve means operatively connected to the piston-cylinder unit for controlling the maximum tension that can be directed to the band of material through said one roller to which the piston-cylinder unit is operatively connected.

3,955,340

APPARATUS FOR BINDING BUNDLES OF SHEETS

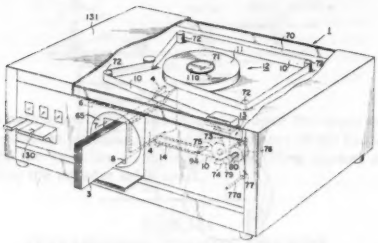
Kahei Tomita, Kawasaki; Takeo Oshima, Himeji; Takashi Toda, Himeji, and Mituo Ikemi, Himeji, all of Japan, assignors to Glory Kogyo Kabushiki Kaisha, Himeji, Japan

Filed July 23, 1974, Ser. No. 491,493

Claims priority, application Japan, July 23, 1973, 48-87207[U]; July 7, 1974, 49-64643

Int. Cl.² B65B *13/04*

U.S. Cl. 53—199 8 Claims



1. In an apparatus for binding a plurality of sheets in a neat bundle, comprising a casing, sheet holder means for holding a bundle of sheets to be bound, tape supply means for supplying a tape to said sheet holder means so as to permit said tape to be wound around said bundle of sheets, and tape bonding means for bonding the tape wound around said bundle of sheets, the improvement comprising revolving means for the sheet holder means for revolving said bundle of sheets relative to said casing, clamping means for clamping said bundle of sheets and pressure regulating means operatively associated with said clamping means for regulating the clamping pressure of said clamping means to two predetermined different degrees of pressure to cause relatively loose clamping of said bundle of sheets prior to the insertion of the loading end of said tape thereinto and relatively tight clamping of said bundle of sheets after the insertion of the loading end of said tape, tape end insertion means for inserting the leading end of said tape into said bundle of sheets through one edge thereof, said tape having an adhesive layer of thermoplastic material formed substantially integrally on one surface thereof, drive means coupled to said sheet holder means for revolving said sheet holder means with said bundle of sheets in a controlled manner so as to wind said tape around said bundle of sheets; and tape bonding means for thermally fastening said tape around said bundle of sheets.

3,955,341

APPARATUS FOR SCREWING CAPS ON CONTAINERS

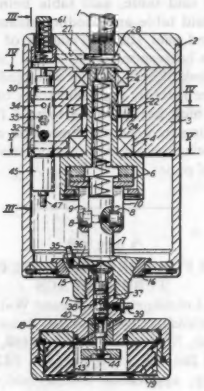
Charles V. Wilhere, Pittsburgh, Pa., assignor to Horix Manufacturing Company, Pittsburgh, Pa.

Filed Oct. 14, 1975, Ser. No. 622,391

Int. Cl.² B67B *1/06*; B65B *7/28*

U.S. Cl. 53—331.5 10 Claims

1. Apparatus for applying a screw cap to a container, comprising a housing continuously rotatable on a vertical axis and having an opening in its bottom, a central vertical shaft in the housing rotatable in opposite directions a limited number of degrees relative to the housing, a chuck below the housing, means connecting the chuck with the shaft for rotation therewith, air pressure actuated gripping means in the chuck for gripping a screw cap, valve means for connecting a source of air pressure with said gripping means for actuation thereof, a valve member secured to said housing and provided with a bleed passage therethrough, means connecting the inlet of said passage with said air source, a closure member normally closing the outlet of the bleed passage, stop means projecting from the side of said shaft, a torque arm rigidly connected to said shaft and projecting from the side of it, compressible means carried by said housing and pressing against said arm to turn it and said shaft with the housing and to cause said stop means to hold said closure away from said bleed passage, air pressure responsive means for shifting said valve means to release air pressure from said gripping means when the torque applied by the gripping means to the screw cap compresses said compressible means so that the chuck substantially stops



rotating, and conduit means connecting said pressure responsive means with said air source and said bleed passage inlet for actuating the pressure responsive means when said valve member moves away from said stop means and closes said passage as said torque compresses said compressible means, whereby said gripping means will be released from the screw cap.

3,955,342

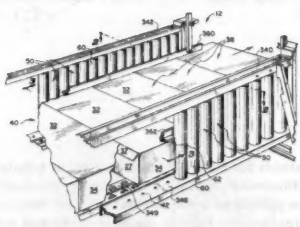
COMPRESSION SECTION ROLLER FOR PACKAGING MACHINE

Richard H. Johnson, Arlington Heights, and Wayne H. Kuhn, Worth, both of Ill., assignors to Stone Container Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 447,100, March 1, 1974, abandoned. This application Nov. 4, 1974, Ser. No. 520,484

Int. Cl.² B65B *51/16*

U.S. Cl. 53—387 6 Claims



1. In a packaging machine which is operable to fold a blank into a carton about an article or articles to be packaged, the carton having at least an end flap and wall and side flaps and walls, the packaging machine including a blank folding station, a flap folding station, and a package completion station with a compression chamber into which partially completed cartons are moved, the improvement comprising, said compression chamber having side walls formed of a plurality of vertically arranged cylindrical rollers, each roller including a rigid cylindrical body portion rotatably mounted on a shaft, an elastic deformable sleeve of soft compressible material formed

on the external surface of the body portion, and a yieldable protective soft thin film cover secured over the entire circumferential surface of the sleeve, whereby the rollers engage the carton and form a resilient planar surface-to-surface interface between the carton walls and the deformed roller to maintain the folded side flaps thereof under pressure in rigid condition for sealing of said side flaps, and the rollers partially inhibit the movement of the cartons through the compression chamber, the sleeve of each roller being resilient so as to regain its undeformed condition after the carton passes out of contact therewith.

3,955,343

FRUIT HARVESTING MACHINE

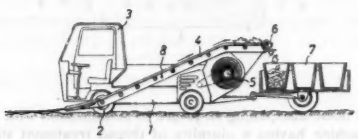
Ramon Tico, Doctor Roux, 100, Barcelona, Spain

Filed Oct. 21, 1974, Ser. No. 516,419

Claims priority, application Spain, Oct. 19, 1973, 419965; Aug. 1, 1974, 429506

Int. Cl.² A01D *90/00*

U.S. Cl. 53—391 **1 Claim**



1. A fruit harvesting machine comprising: means at the front end of said machine for picking up an elongated discontinuous flexible belt previously laid on the ground between two successive rows of plants whose fruit is to be harvested, means for guiding, supporting, and moving said flexible belt in said machine from said front end thereof towards the rear, said last mentioned means comprising roller train means extending rearwardly from said machine, container means coupled to said fruit harvesting machine for receiving the fruit from said flexible belt supported on said roller train means, and drum means located beneath said roller train means for winding up said belt.

3,955,344

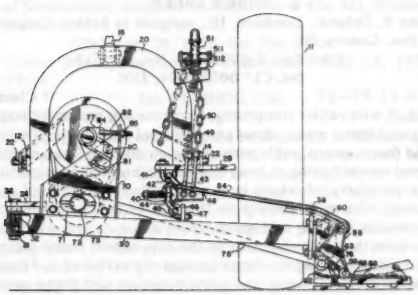
PITMAN MOWER

Robert Sorensen, Glen Ellyn; Richard A. Zablocki, Downers Grove, and Paul C. Gordon, Hinsdale, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Apr. 10, 1975, Ser. No. 566,878

Int. Cl.² A01D *35/08*

U.S. Cl. 56—10.4 **8 Claims**



1. A pitman mower adapted for attachment to a tractor having a vertically movable implement hitch comprising:

a hitch frame adapted for attachment to said tractor hitch;

a transversely extending drag bar;

a transversely extending cutterbar pivotally mounted to said drag bar for vertical swinging movement, said cutterbar including a sickle;

drive means for said sickle mounted on said drag bar;

a generally fore-and-aft extending link having a forward end pivotally mounted to said hitch frame for rotation about a vertical axis and a rearward end mounted to said drag bar by means preventing pivotal movement therebetween in the horizontal plane, said link being resilient in the transverse direction;

a generally fore-and-aft extending pull bar having a forward end mounted for pivotal movement to said hitch frame and a rearward end mounted for pivotal movement to said drag bar, said pull bar being rotatable about an axis generally longitudinal thereof;

gag link means interconnecting said cutterbar and said pull bar and disposed to exert a torque thereon due to the weight of said cutterbar;

a floatation spring interconnecting said hitch frame and said pull bar and disposed to exert a torque thereon in opposition to said torque exerted by said gag link means; and

lifting member interconnecting said pull bar and said hitch frame and disposed to rotate said pull bar against said torque exerted by said gag link means upon said hitch frame being raised.

3,955,345

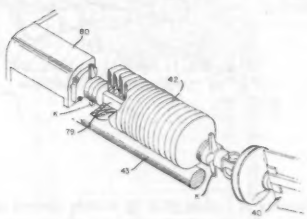
TOBACCO HARVESTER DEVICE

John D. Mitchell, and Bertram L. Jordan, both of Lewiston, N.C., assignors to Harrington Manufacturing Company, Lewiston, N.C.

Filed Sept. 23, 1974, Ser. No. 508,610

Int. Cl.² A01D *45/16*

U.S. Cl. 56—27.5 **2 Claims**



1. In the known type of tobacco harvester which includes two laterally spaced apart elongated defoliators, each elongated defoliator having a web that is adapted to rotate about an elongated axis, and a drive shaft connected to the rear end of each defoliator so as to rotate each defoliator about its elongated axis, the improvement which comprises at least one cutter blade extending radially outwardly each said drive shaft, each said cutter blade being sturdy enough to chop up stalks that are not properly aligned so as to pass between the defoliators.

3,955,346

APPARATUS FOR THE RECOVERY OF COTTON FROM THE GROUND

James G. Coon, 68 Madrid Plaza, Mesa, Ariz. 85201

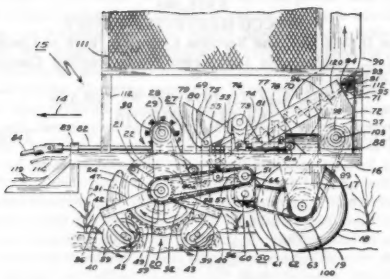
Filed Feb. 21, 1974, Ser. No. 444,643

Int. Cl.² A01D *51/00*

U.S. Cl. 56—28 **10 Claims**

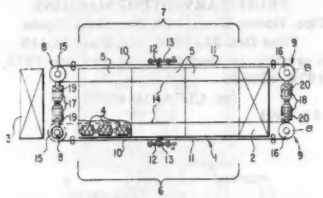
1. A trailer apparatus for recovering cotton from the ground comprising:

a. a frame having wheels thereon for movably supporting said frame;
b. a sub-frame pivotably mounted on said frame and having a spaced pair of arms which extend longitudinally of said frame and are vertically movable in radial paths;
c. adjustment means connected between said frame and said sub-frame for adjustably limiting the downward vertical movement of the arms of said sub-frame;
d. a shaft rotatably journaled between the arms of said sub-frame and vertically movable therewith;
e. a collector cylinder fixed on said shaft for rotating and vertically moving therewith, said collector cylinder having cotton impaling teeth on the periphery thereof;
f. a pair of yoke frames rotatably journaled on said shaft and each having a bar which is parallel to said shaft, said yoke frames disposed to position their respective bars below said shaft and on opposite sides thereof adjacent the periphery of said collector cylinder;
g. roller means on each of said pair of yoke frames and in engagement with the underside of said frame for producing a scissor movement of said yoke frame about said shaft in response to vertical movements thereof with that scissor movement resulting in opposite movements of the bars of said yoke frames in radial paths about the periphery of said collector cylinder;



h. a plurality of cotton pick-up wheels carried oon each of the bars of said yoke frames and maintained thereby in contact with the ground and at a predetermined distance from the periphery of said collector cylinder;
i. means for mounting said cotton pick-up wheels to the bars of said yoke frames so that said pick-up wheels are free to roll over the ground and follow the contours thereof;
j. each of said cotton pick-up wheels having a plurality of teeth on the periphery thereof for picking cotton off of the ground and moving that cotton into the proximity of the teeth of said collector cylinder;
k. a cylindrical brush rotatably journaled between the arms of said sub-frame and located above said shaft adjacent the periphery of said collector cylinder;
l. drive means on said frame and coupled to said collector cylinder and to said brush to rotate said collector in a direction opposite to the rotation of said cotton pick-up wheels and to rotate said brush in a direction opposite to the rotation of said collector cylinder so that cotton picked up by said pick-up wheels will be removed by and become impaled on the teeth of said collector cylinder and that impaled cotton will be removed from the teeth of said collector cylinder by said brush; and
m. means mounted on said frame for receiving the cotton removed from said collector cylinder by said brush.

3,955,347
ANTI-NOISE STRUCTURES ON MULTI-POSITION TEXTILE MACHINES
Heinz Schippers, Remscheid, Germany, assignor to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany
Filed Sept. 12, 1974, Ser. No. 505,330
Claims priority, application Germany, Sept. 18, 1973, 2346869
Int. Cl.² D01H *9/00*
U.S. Cl. 57—1 R **9 Claims**

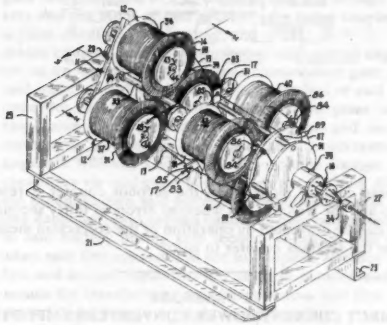


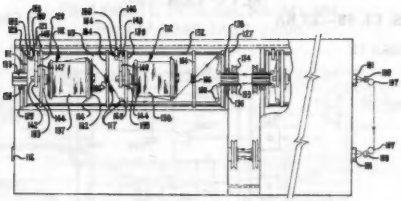
1. A noise-dampening structure in combination with a textile machine having a plurality of thread treatment stations positioned at longitudinally spaced intervals along at least one elongated longitudinal face of the textile machine, said noise-dampening structure embodying sound-deadening web means for covering wholly or partially at least several of said stations on said longitudinal face of the textile machine and providing at least one noise-shielding zone opposite at least several of said stations, said web means comprising two, upstanding, horizontally-elongated, sound-dampening foils movable in the same or opposite horizontal directions seam-forming means providing a vertical seam between the respective foils, each foil having a length which is at least substantially the length of said noise-shielding zone whereby either foil may be extended across substantially the full length of said noise-shielding zone, and storer means for storing and releasing each respective foil to permit longitudinal, horizontal movement of the respective foils in said zone along the longitudinal face of the machine together in the same horizontal directions with said seam closed across substantially the full length of said noise-shielding zone and in opposite, horizontal directions to allow said foils to be separated at said seam-forming means to provide access to one or more of said stations.

3,955,348
WIRE CABLER
John F. Orlandi, Lombard, Ill., assignor to Belden Corporation, Geneva, Ill.
Filed Feb. 3, 1975, Ser. No. 546,633
Int. Cl.² D07B *3/04, 3/06*
U.S. Cl. 57—13 **7 Claims**

1. A wire cabler comprising, frame means, means for rotating said frame means about an axis, spool means supported on said frame means, cable wire wound on said spool means, said spool means having at least one circumferential edge portion the periphery of which is spaced radially outward of said wound wire with respect to the axis of said spool means, means for rotating said spool means about its axis which extends in the same direction as the axis of said frame means, said rotation being in a direction opposite to that of said frame means, a cabling head, and guide means on said frame means for guiding said wire to said cabling head, said guide means being positioned to cause said wire to pass from said spool means in contact with said edge portion, said frame rotating means and said spool rotating means being of a configuration

to rotate said frame means and said spool means at a relative rate such that the twist imparted to said wire is substantially





equal but in opposite directions for full and nearly empty spool means.

3,955,349

PROCESS AND APPARATUS FOR CONTROLLING TWIST DENSITY DURING TEXTURING

Kurt Greenwood, Ulisbach, and Philippe Lanz, Wattwil, both of Switzerland, assignors to Heberlein & Co. AG, Wattwil, Switzerland

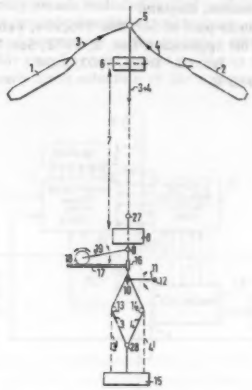
Filed Apr. 28, 1975, Ser. No. 572,077

Claims priority, application Switzerland, May 22, 1974, 7013/74

Int. Cl.² D02G *1/02*

U.S. Cl. 57—34 HS **9 Claims**

1. Apparatus for controlling the twist density of filaments of thermoplastic material while the filaments are textured in a processing zone by imparting a temporary high twist to the filaments and heat-setting the filaments in the high-twisted condition, the apparatus comprising a friction twist imparter adapted continuously to ply-twist together two filaments while passing through the processing zone, said friction twist imparter receiving the ply-twisted filaments after traversing the processing zone, means for separating the ply-twisted filaments into two separated filaments at a separation point displaced from said twist imparter along the path of the ply-twisted filaments, means for continuously sensing variations in the position of said separation point along said path, and means responsive to said sensing means for controlling the ply-twist density of the filaments passing through the process-



ing zone by modifying a physical condition of the ply-twisted filaments passing through said friction twist imparter.

3,955,350

FALSE TWISTER

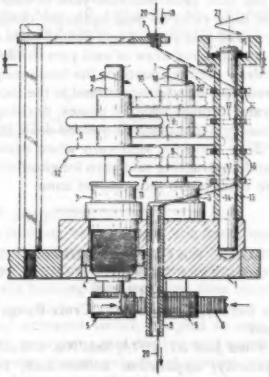
Friedrich Schuster, Hammelburg, Germany, assignor to Kugelfischer Georg Schafer & Co., Schweinfurt, Germany

Filed Dec. 10, 1974, Ser. No. 531,316

Claims priority, application Germany, Dec. 11, 1973, 2361674

Int. Cl.² D02G *1/04*; D01H *7/92*

U.S. Cl. 57—77.4 **13 Claims**



1. An apparatus for false-twisting threads comprising three spindles arranged to rotate about substantially parallel axes and fixed at the corners of a triangle centered on the mean path of the thread, friction elements secured to the spindles for rotation therewith, means for moving the thread between a diverted position clear of the friction elements and a false-twisting position in which the thread follows a zig-zag path between the friction elements comprising means for moving the thread to be shifted to a stable intermediate position and into engagement with at least one friction element of at least one spindle for starting up the false twisting.

3,955,351

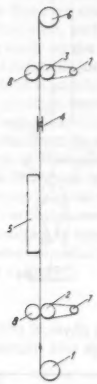
PRODUCTION OF BULKED YARNS

Clive Righton Jones, and Michael John Rogerson, both of Pontypool, England, assignors to Imperial Chemical Industries Inc., London, England

Continuation-in-part of Ser. No. 796,994, Feb. 6, 1969, abandoned. This application Dec. 2, 1971, Ser. No. 204,133

Int. Cl.[2] D02G *1/02*, *3/24*

U.S. Cl. 57—140 R 10 Claims



1. A continuous process to produce false twist crimped polyester yarn without excessive filamentation which comprises feeding a drawable polyester yarn into a yarn false twist crimp inducement zone bounded by yarn feeding means and yarn drawing means, forwarding said drawable yarn from said feed means while still in said drawable state to a heated segment of said zone and heating said yarn to a temperature at which it draws in said heated zone while simultaneously inserting false twist into said yarn by means of a false twist device and setting the false twist into said yarn in said heated zone; allowing said false twist to pass upstream through the draw necking portion of said yarn in said heated zone while accomplishing the total desired draw of said yarn in said heated zone at said yarn draw necking portion, the frequency of said false twist being reduced about proportional to the increasing diameter of the yarn through which it passes; drawing said yarn in said crimp inducement zone at a desired draw ratio below the "standard" draw ratio for said yarn when drawn in the flat yarn state, and contracting said yarn longitudinally after leaving said false twist crimp inducement zone.

3,955,352

ELECTRONIC WATCH WITH DIGITAL DISPLAY HAVING A CORRECTION MECHANISM FOR SMALL ERRORS

Jean-Claude Berney, Chemin de la Croix-Rouge 2, Lausanne, Switzerland

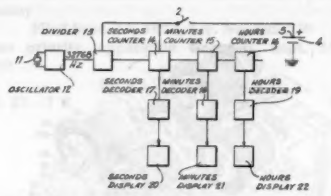
Filed Jan. 31, 1974, Ser. No. 438,456

Claims priority, application Switzerland, Feb. 1, 1973, 1419/73

Int. Cl.[2] G04C *3/00*

U.S. Cl. 58—23 R 5 Claims

1. An electronic watch having a digital display comprising means including an oscillator and a frequency divider connected to said oscillator for producing signals of 1 H_z, a seconds counter connected to said frequency divider, a minutes counter connected to said seconds counter, an hours counter connected to the minutes counter, electronic means connected to said counters for displaying the state of the counters and correction means operable independently of the minutes and hours counters to reset to zero the seconds counter and at least part of the frequency divider, said seconds counter including a plurality of counter units connected in series, the last unit being a binary counter which produces a pulse when the seconds counter is reset to zero to advance the minute counter by one unit when the watch is slow and to leave the



minute counter alone when the seconds counter is reset to zero and the watch is fast whereby errors of thirty seconds or less can be corrected by operation of the correction means to reset the seconds counter to zero.

3,955,353

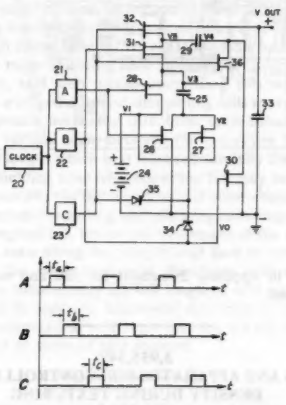
DIRECT CURRENT POWER CONVERTERS EMPLOYING DIGITAL TECHNIQUES USED IN ELECTRONIC TIMEKEEPING APPARATUS

Brian Astle, Princeton, N.J., assignor to Optel Corporation, Princeton, N.J.

Filed July 10, 1974, Ser. No. 487,319

Int. Cl.[2] G04C *3/00*

U.S. Cl. 58—23 BA 15 Claims



1. In an electronic watch assembly of the type employing an accurate source of oscillations for providing a timekeeping signal, said watch including a low voltage battery for energizing circuitry included in said watch, the combination therewith of apparatus for converting said low voltage battery potential to a higher voltage level, comprising:

a. means coupled to said accurate source of oscillations for providing at least first and second waveforms synchronized one to the other, said waveforms characterized in that said first one is at a positive level when said second one is negative and vice versa, said waveforms having no condition where both can be positive or both can be negative, as the waveforms do not overlap,

b. a first capacitor having a first and second terminal,

c. a second capacitor having a first and second terminal with said second terminal coupled to a point of reference potential,

d. a plurality of transmission gates each having an input and output terminal and capable of operating in a low impedance state upon application of a predetermined potential

level to a control electrode associated with each of said gates,

e. means coupling one of said terminals of said first capacitor to an output terminal of a first one of said transmission gates and said other terminal to an output of another of said transmission gates, the input of said first transmission gate being coupled to a terminal of said low voltage battery and the input of said another gate being coupled to a point of reference potential, and

f. means coupling said first terminal of said second capacitor to an output of still another transmission gate with said input of said gate coupled to a terminal of said first capacitor, said control electrodes of said gates being responsive to a selected one of said first and second waveforms to energize said gates in a predetermined sequence whereby said low battery voltage charges said capacitors via said gates in a manner to provide a different potential then said battery potential across said second capacitor, said second capacitor only being coupled to said battery during said second waveform and only when said first capacitor is not so coupled, whereby said first and second capacitors are never in parallel, and

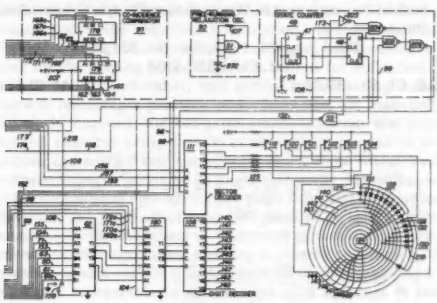
g. means for transferring said charge across said first and second capacitors to a third output capacitor.

3,955,354

DISPLAY FOR ELECTRONIC CLOCKS AND WATCHES

Jack S. Kilby, and Robert F. Schweitzer, both of Dallas, Tex., assignors to Jack S. Kilby, Dallas, Tex.

Filed Feb. 11, 1974, Ser. No. 441,384
Int. Cl.² G04B *19/30, 19/06*
U.S. Cl. 58—50 R **27 Claims**



1. In an electronic timepiece with horologic display, the combination which comprises:

a. a plurality of individually energizable display elements arranged in a single ring; and

b. logic means connected to said display elements to display the hour and minute on the same complete display element by indications of different visual character.

3,955,355

ELECTRONIC CALCULATOR WATCH STRUCTURES

Nunzio A. Luce, Trenton, N.J., assignor to Optel Corporation, Princeton, N.J.

Filed Mar. 27, 1974, Ser. No. 455,378
Int. Cl.² G04B *19/30, 37/12;* **G06F** *7/38*
U.S. Cl. 58—50 R **15 Claims**

1. An electronic calculator watch apparatus of the type including a digital display capable of directly displaying a given number of digits, comprising:

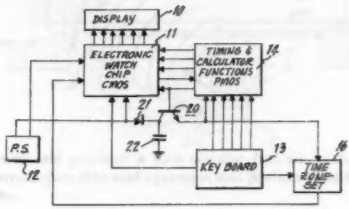
a. a power source for energizing electronic circuitry;

b. a source of stable oscillations for providing at an output, an accurate frequency reference signal;

c. a time-keeping circuit responsive to said reference signal for providing at an output, a signal capable of being displayed and indicative of the time of day;

d. a selectable timing and calculator circuit responsive to said reference signal to provide a series of timing waveshapes adapted to aid in performing algorithmic operations under control of numerical inputs furnished by an input entry means included in said calculator circuit;

e. switching means coupled to said timing and calculating means and responsive to the selection of said calculator circuit for coupling said power source to said calculator circuit only upon selection of the same, whereby power



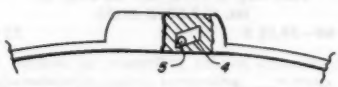
is dissipated by said calculator section only during a predetermined time necessary to perform said operation, said switching means including a transistor having a collector electrode, a base electrode and an emitter electrode, with said collector to emitter electrode path coupled between a power terminal of said calculator chip and said power source to energize said calculator chip during said predetermined time, said base electrode coupled to means for selecting said calculator circuit.

3,955,356

WATCH HAVING POSITIONED CONTROLLED DISPLAY ACTUATOR

Andrew D. LeCocq, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 19, 1974, Ser. No. 452,500
Int. Cl.² G04B *19/34;* **H01H** *35/02*
U.S. Cl. 58—50 R **11 Claims**



1. A watch comprising:

a. a watch housing having upper and lower major surfaces parallel to a central plane;

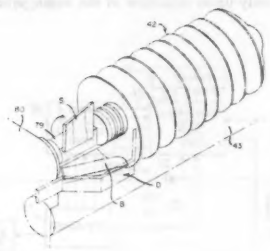
b. an electro-optical time display selectively positioned within said housing for displaying time upon command; and

c. a gravity actuated switch coupled to said display for selectively energizing said display, said switch comprising means having a cavity, electrical contact terminal means positioned at one end of said cavity, and a gravity responsive mass of electrical conductor movably contained within said cavity for making contact between said electrical contact terminal means only upon engagement therewith, said switch being positioned in said housing with said cavity displaced at a predetermined acute angle with respect to said central plane, said one end of said cavity being disposed in said housing closer to said upper major surface than the remainder of said cavity such that said switch actuates said display when the central plane of said watch housing is angularly displaced from the horizontal to at least an angle greater than said predetermined angle.

3,955,357
TOBACCO HARVESTER DEVICE

Clarence C. Mercer, Walstonburg, N.C., assignor to Harrington Manufacturing Company, Lewiston, N.C.

Filed Sept. 23, 1974, Ser. No. 508,608
Int. Cl.² A01D 45/16
U.S. Cl. 56—27.5 2 Claims



1. In the known type of tobacco harvester which includes two laterally spaced apart elongated defoliators, each elongated defoliator having a web that is adapted to rotate about an elongated axis, and a drive shaft connected to the rear end of each defoliator so as to rotate each defoliator about its elongated axis, the improvement which comprises

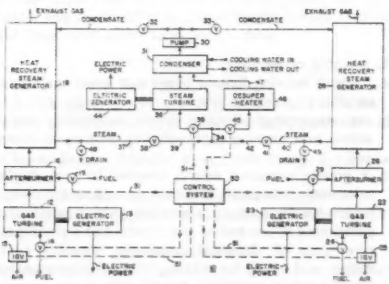
a. a shear blade mounted on each drive shaft, said shear blade being adapted to rotate when said drive shaft rotates, and

b. a shear base fixed to a non-rotating portion of the tobacco harvester and adapted to cooperate with said shear blade to cut stalks that enter the area between and adjacent to said shear blade and shear base.

3,955,358
COMBINED CYCLE ELECTRIC POWER PLANT AND A HEAT RECOVERY STEAM GENERATOR WITH IMPROVED FLUID LEVEL CONTROL THEREFOR

Lyle F. Martz, Verona, Pa., and Richard J. Plotnick, Cherry Hill, N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 8, 1974, Ser. No. 495,738
Int. Cl.² F01K 23/06
U.S. Cl. 60—39.18 B 32 Claims



1. A combined cycle electric power plant comprising:

a. at least one gas turbine including an exit through which heated exhaust gases pass;

b. means for generating steam coupled to said gas turbine exit for transferring heat from the exhaust gases to a fluid passing through said steam generating means;

c. a steam turbine coupled to said steam generating means and driven by the steam supplied thereby;

d. means for generating electric power by the driving power of said turbines;

e. condenser means for receiving and converting the spent steam from said steam turbine into condensate, said condenser means including a hotwell storage portion for receiving and storing the condensate;

f. said steam generating means including a deaerator for receiving condensate from said condenser and storing the received condensate in a storage portion thereof, a feedwater pump for directing the stored fluid from said deaerator storage portion to a first heat exchange tube, a main drum associated with said first heat exchange tube for receiving the heated fluid therefrom, and a second heat exchange tube associated with said main drum for receiving fluid therefrom and for heating the fluid by the exhaust gases from said gas turbine into superheated steam to be directed to said steam turbine;

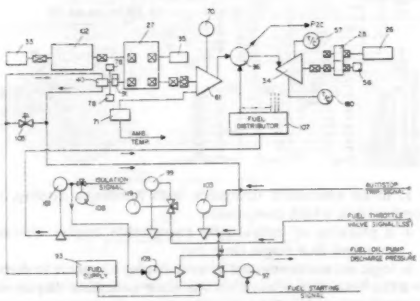
g. condensate valve means for controlling the flow of condensate from said condenser hotwell storage portion to said deaerator; and

h. means for controlling the operation of said turbines and said steam generating means comprising fluid level control means responsive to the flow of superheated steam to said steam turbine for regulating the flow of condensate into said deaerator storage portion in accordance therewith.

3,955,359
BEARING TEMPERATURE SYSTEM FAILURE DETECTION APPARATUS SUITABLE FOR USE IN POWER PLANTS AND LIKE APPARATUS

Robert A. Yannone, Aldan, and James J. Shields, Philadelphia, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 20, 1973, Ser. No. 371,624
Int. Cl.² F02C 9/08
U.S. Cl. 60—39.28 T 15 Claims



1. In a gas turbine electric power plant having a gas turbine and a control system therefor, a protective alarm monitoring system for said turbine comprising:

a. sensing means for sensing the status of a given parameter at a predetermined portion of said turbine and for generating a signal representative thereof;

b. first means, responsive to said sensing means, for determining when said parameter signal represents a reasonable alarm condition which reflects a need for corrective scheduled control of said turbine upon such determination;

c. second means, responsive to said sensing means, for determining when said reasonable alarm condition parameter signal represents a non-parameter reasonable alarm condition which reflects protective system apparatus malfunction not requiring any change in normal turbine operation; and

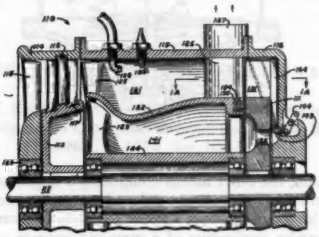
d. initiating means, responsively coupled to said first and second means for determining and to said turbine control system, for initiating corrective scheduled control of said turbine only when said parameter signal represents a reasonable alarm parameter signal condition.

3,955,360

INTEGRATED FLOW WASHBOARD TURBINE

Earl W. Traut, 8040 Palm Lake Drive, Fort Lauderdale, Fla. 32811

Filed July 8, 1974, Ser. No. 486,312
Int. Cl.² 415 76; F02C 3/06; F01D 1/34
U.S. Cl. 60—39.36 20 Claims



1. A turbine engine including a turbine wheel with connected compressor, at least one combustion chamber wherein fuel can be burned in order to generate hot gases, said turbine wheel and compressor being surrounded by suitable housing means and being mounted for rotation, with the rotation thereof causing said compressor to supply compressed air both for the cooling of the engine as well as for utilization in said combustion chamber, said turbine wheel having means thereon including a plurality of surfaces that are essentially circularly disposed, the hot gases emanating from said combustion chamber being directly at an angle to the axis of the turbine and toward said surfaces on said turbine wheel, such surfaces being oriented at an angle essentially perpendicular to the direction of flow off the hot gases from said combustion chamber, the reaction of such hot gases upon said surfaces causing said turbine wheel to rotate and thus drive said compressor in rotation, means defining a plurality of cooling air openings in said turbine wheel, means for directing cooling air from said compressor to and through such openings in said turbine wheel such that cooling air is interposed between said surfaces and the hot gases, thus to extend the useful life of said turbine wheel, and common exhaust means for said hot gases and cooling air.

3,955,361

GAS TURBINE COMBUSTOR WITH CONTROLLED FUEL MIXING

Robert M. Schirmer, and Ellsworth H. Fromm, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

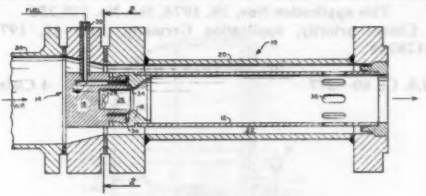
Division of Ser. No. 208,137, Dec. 15, 1971, Pat. No. 3,820,320. This application Apr. 11, 1974, Ser. No. 460,040
Int. Cl.² F02G 3/00; F02C 7/22
U.S. Cl. 60—39.65 19 Claims

1. A combustor comprising, in combination:

a flame tube;

air inlet means for introducing a swirling stream of air flowing in a downstream direction into the upstream end portion of said flame tube as the sole stream of air introduced into said upstream end portion of said flame tube; and

fuel inlet means for forming a sole annular stratum of fuel around said stream of air flowing into said flame tube by introducing said fuel in a direction toward and which is from tangential to less than perpendicular, but non-parallel, to the periphery of said stream of air to effect controlled mixing of said fuel and air at the interface therebetween and produce a sole annular fuel-air mixture for introduction into said upstream end portion of said flame tube.

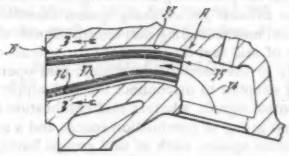


3,955,362

EXHAUST HEAT CONSERVATION

Charles M. Jones, Detroit, and Hai Wu, Northville, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 2, 1974, Ser. No. 494,270
Int. Cl.² F01N 3/10; F02B 75/10
U.S. Cl. 60—274 21 Claims



1. A method for controlling exhaust emissions from an internal combustion engine, comprising:

a. inducting two phases of a combustible mixture into a combustion zone of said engine, one phase having a rich and the other a lean fuel component so that the average air/fuel ratio of both said phases is in the range of 17–20:1 at part engine load and about 14:1 at maximum torque whereby combustion will take place with excess stoichiometric oxygen,

b. compressing and combusting said two phases of said mixture, said combustion being initiated in the rich phase so that exhaust gases resulting therefrom will contain a lower amount of unburned hydrocarbons and nitrogen oxides than carbon monoxide and oxygen, and

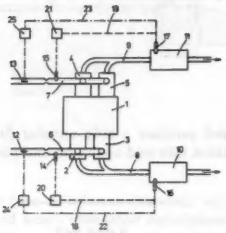
c. controlling the withdrawal of exhaust gases from said combustion zone through a passage immediately adjacent said zone, said passage being defined by an outer wall and having an inner space thereof with at least the outer peripheral zone thereof subdivided to insure that flow therethrough is substantially coherently streamlined with little or no local disturbances, said flow having a reduced convective heat transfer coefficient to retain a greater amount of heat of said exhaust gases so that a higher temperature can be maintained resulting in chemical reaction of the CO and O_2 content of said exhaust gases to provide a self-cleaning function.

3,955,363

COMBUSTION ENGINE WITH AT LEAST ONE EXHAUST GAS CLEANING ARRANGEMENT

Peter Manderscheid, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Continuation of Ser. No. 262,006, June 12, 1972, abandoned.
This application Nov. 29, 1974, Ser. No. 528,256
Claims priority, application Germany, June 11, 1971, 2128988
Int. Cl.² F02B 75/10
U.S. Cl. 60—277 4 Claims



1. In a motor vehicle having a combustion engine including groups of combustion spaces, fuel and combustion air dosing means for each of said groups of combustion spaces, means operating said dosing means, an exhaust gas conduit system and a thermally or catalytically operable exhaust gas cleaning arrangement associated with said exhaust gas conduit system, the improvement comprising the combination of a temperature sensing means provided in said exhaust gas cleaning arrangement for producing control signals when the temperature of the exhaust gas cleaning system exceeds a predetermined value, means feeding said control signals to the operating means of said fuel dosing means for at least reducing the fuel supply to the combustion engine, said operating means also being adapted to disconnect the fuel supply in response to said control signals, wherein said combustion engine comprises a first group of combustion spaces and a second group of combustion spaces, each of said groups having a separate exhaust gas conduit means having an exhaust gas cleaning arrangement placed therein, a temperature sensor provided in each of said exhaust gas cleaning systems for developing a control signal for controlling the operating means of said fuel dosing means and said combustion air dosing means of one of said groups independently of the other of said groups of combustion spaces.

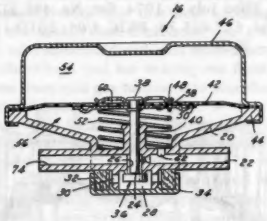
3,955,364

ENGINE DECELERATION VACUUM DIFFERENTIAL VALVE CONTROL

John A. Lewis, Detroit, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jan. 4, 1974, Ser. No. 430,818
Int. Cl.² F02B 75/10
U.S. Cl. 60—290 2 Claims

1. A vacuum flow control for use with an internal combustion engine having an intake manifold providing a source of vacuum varying from an essentially atmosphere pressure level during wide open throttle engine operations to a maximum subatmospheric level during engine decelerations, including a passage connecting the manifold vacuum to a vacuum unit, the passage having a flow restrictor and an air bleed between the restrictor and the unit for at times decaying the vacuum to the unit, a valve movable between a normal position closing the air bleed and a second position opening the air bleed, and valve actuating means connected to the valve and to the manifold vacuum and operative in response to deceleration operations of the engine increasing the manifold vacuum level above a predetermined value to move the air bleed valve to the second air bleed open position, the valve actuating means including other means operable to return the air bleed valve to the normal position closing the bleed even though the vacuum is above the predetermined level, the valve actuating means including a servo having movable piston means connected to the valve, means connecting manifold vacuum to opposite sides of the piston means for at times moving the valve to the second position by a differential vacuum force, a spring biasing the piston means towards the closed valve nor-



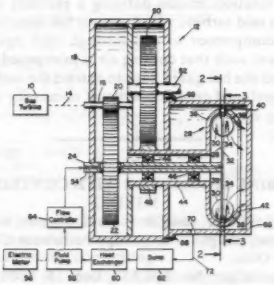
mal position, the other means comprising a flow restrictor in the piston means providing a delayed communication of the pressure levels on opposite sides of the piston means to each other whereby application of a manifold vacuum of a level above the predetermined level to one side of the piston means moves the valve to the second open air bleed position and maintains the valve in the second position until communication of the vacuum through the restrictor decays the differential vacuum force to a level permitting movement of the valve to the normal closed air bleed position by the spring.

3,955,365

FLUID COUPLED DRIVE APPARATUS

Masachika Arao, Chatsworth, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Continuation of Ser. No. 428,487, Dec. 26, 1973, abandoned.
This application Apr. 28, 1975, Ser. No. 572,677
Int. Cl.² F16D 33/06
U.S. Cl. 60—330 5 Claims



1. Gas turbine engine drive apparatus comprising:
a single shaft gas turbine engine having an output shaft;
an input drive shaft connected to said output shaft of said gas turbine engine;
an output drive shaft adapted for connection to a load;
intermediate shaft means including a first rotary shaft having a first and a second end and a second rotary shaft having a first end and a second end, said first end of said first shaft being adjacent said first end of said second shaft, and said second end of said first shaft being adjacent said second end of said second shaft;

bearing means between said first shaft and said second shaft for concentrically supporting said second shaft with respect to said first shaft;

first speed reduction gear means between said input drive shaft and said first end of said first rotary shaft for driving said first shaft at a slower speed than said input shaft;

second speed reduction gear means between said first end of said second rotary shaft and said output drive shaft for driving said output shaft at a slower speed than said second shaft;

said intermediate shaft means also including fluid coupling means interconnecting said second end of said first shaft and said second end of said second shaft; and

means for supplying said fluid coupling means with metered fluid to vary the torque transmitted to said output drive shaft.

3,955,366

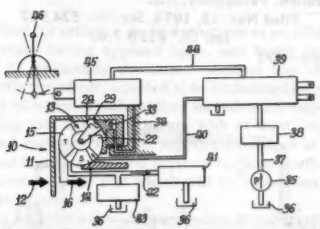
TORQUE CONVERTER POWER CAPACITY VARYING MEANS

Robert C. Hansen, and Lowell E. Johnson, both of East Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 1, 1974, Ser. No. 519,984

Int. Cl.² F16D *33/04*

U.S. Cl. 60—347 **6 Claims**



1. In a torque converter including a housing and having an input, an output, an impeller connected to said input, a turbine connected to said output, and a stator mounted within said housing, the improvement comprising:

means for varying the torque capacity of said torque converter, said means including means for varying the capacity of said impeller;

said impeller comprises a plurality of blades having a fixed inner portion and a variable-radius outer portion;

said means for varying the capacity of said impeller comprises means for varying the radii of the impeller blades; and,

variable stop means engageable by said variable-radius outer portion to define the radius of said impeller.

3,955,367

FLUID CLUTCHES

John Edward Becker, Bowmanville, Canada, assignor to Cluaran Associates Ltd., Oshawa, Canada

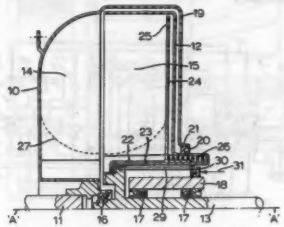
Filed Dec. 18, 1974, Ser. No. 534,035

Claims priority, application United Kingdom, Dec. 28, 1973, 59995/73

Int. Cl.² F16D *33/06*

U.S. Cl. 60—347 **6 Claims**

1. A fluid clutch comprising power input and power output means, a pump element and a turbine element connected respectively to the power input and output means for rotation thereby and providing respectively co-operating pump and turbine chambers rotatable about the same axis and constituting a working chamber, a set of vortex-producing vanes in each of the pump and turbine chambers respectively, a quantity of liquid in the working chamber, baffle means mounted by one of the said elements within the working chamber for movement relative to the said vanes between a de-clutched position in which the baffle means prevents the maintenance of such vortices and a clutched position in which establishment and maintenance of such vortices is permitted, the said baffle means in their movement between the said de-clutched and clutched positions changing the operative volume of the element chamber in which they are mounted to effect the respective de-clutching and clutching action.



3,955,368

HYDRAULIC COUPLING WITH CONTROLLABLE POWER TRANSMISSION CAPACITY

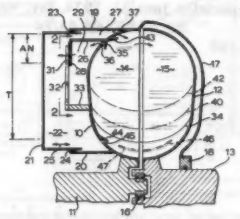
John E. Becker, Bowmanville, Canada, assignor to Cluaran Associates Ltd., Oshawa, Canada

Filed Mar. 3, 1975, Ser. No. 554,359

Claims priority, application United Kingdom, Mar. 6, 1974, 10007/74

Int. Cl.² F16D *33/06, 33/12*

U.S. Cl. 60—357 **13 Claims**

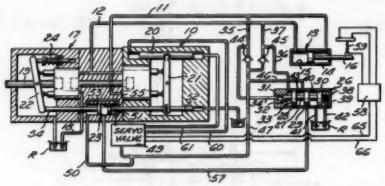


1. A hydraulic coupling comprising cooperating pump and turbine elements each having therein a respective set of radial vortex-producing vanes and mounted for rotation about coaxial axes, means for connecting the pump and turbine elements respectively to a prime mover and means to be driven by the coupling, a reservoir rotatable with the pump element, catch means in the working chamber operative under normal operating conditions for feeding operating fluid continuously from the working chamber to the reservoir, speed responsive valve means in the reservoir controlling the return of operating fluid to the working fluid in the coupling for analogization of its power transmission capacity, and catch means in the working chamber intercepting working liquid upon the existence of stall conditions with the turbine element and delivering liquid to the reservoir to reduce the power transmission capacity automatically to the lower value.

3,955,369
ACTUATOR AVERAGE PRESSURE MAINTENANCE IN CLOSED LOOP SYSTEM

Charles A. Kubilos, Oxnard, Calif., assignor to Abex Corporation, New York, N.Y.

Filed Apr. 16, 1975, Ser. No. 568,488
Int. Cl.² F16H *39/46*
U.S. Cl. 60—445 **16 Claims**

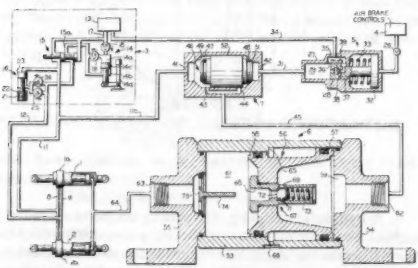


1. A system for controlling a fluid actuator having a movable piston and rod mounted in a bore in the actuator, comprising a variable displacement pump having a movable displacement control, means connecting the pump to the actuator to supply fluid to one side of the actuator and to receive fluid from the other side to move the piston, and a makeup pump for supplying pressure fluid to make up system fluid losses, characterized by the improvement comprising actuator pressure control means for controlling the average of the fluid pressure acting on each side of the actuator including means for setting a desired average of the fluid pressures, means for sensing the average of the fluid pressures and means for providing makeup pressure fluid to the actuator to increase the fluid pressures when the sensed average of the fluid pressures is less than the set average of the fluid pressure.

3,955,370
HYDRAULIC SLACK ADJUSTER AND BRAKE CIRCUITS THEREFOR

Thomas H. Engle, Cape Vincent, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Continuation of Ser. No. 302,415, Oct. 31, 1972, abandoned.
This application June 21, 1974, Ser. No. 483,843
Int. Cl.² F16D *65/74*
U.S. Cl. 60—590 **4 Claims**



1. A hydraulic slack adjuster comprising

a. a pair of expansible chamber hydraulic motors having respective working spaces within a hydraulic cylinder which are of different diameters and are isolated from each other by movable reaction pistons in the respective chambers which are subject to the pressures in the respective spaces, said pistons being of different diameters and being connected in opposing relationship so that they move in unison in response to differences between pressures in the working spaces and vary in reverse senses the volumes of those spaces;

b. cover plates at the ends of the cylinder for limiting motion of the pistons in both directions of movement;

c. a spring biased relief check valve having a seat axially disposed in an axial opening through the pistons and responsive to difference in pressure in the chambers for permitting flow from the working space of smaller diameter to the working space of greater diameter whenever pressure in the smaller diameter chamber is materially greater than pressure in the larger diameter chamber irrespective of the position of the pistons;

d. the cover plates having passages formed therein for delivering fluid to and from the respective working spaces;

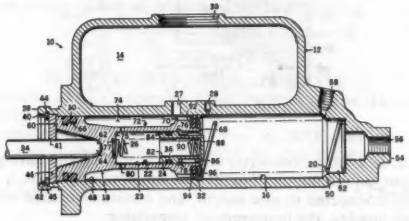
e. a detent extending axially within the passage adjoining the smaller diameter chamber for unseating the check valve when the pistons have completed their movement to the cover plate at the end of the smaller diameter chamber; and

f. means for impeding back flow from the working space of the second motor to the working space of the first motor through the relief check valve when the pistons have reached their fully operated positions to the cover plate at the end of the smaller diameter chamber.

3,955,371
ANTI-CUP CUTTING MASTER CYLINDER

Richard C. Bueler, Des Peres, Mo., assignor to Wagner Electric Corporation, Parsippany, N.J.

Filed Nov. 18, 1974, Ser. No. 524,962
Int. Cl.³ F15B *7/00*
U.S. Cl. 60—592 **8 Claims**



1. A master cylinder comprising:

a housing having a first cavity formed therein;

reservoir means in the housing for containing fluid therein:

a first piston movable within the first cavity, the first piston having a second cavity formed therein in open fluid communication with the first cavity, and an annular groove formed in the outer periphery thereof between first and second ends of the piston;

seal means mounted on the first piston in the outer periphery thereof adjacent the first and second ends for sealingly separating the annular groove and the first cavity;

a second piston sealingly and slidably mounted within the second cavity;

a plurality of port means cooperatingly formed in the housing and the first piston for permitting fluid communication between the reservoir and the first cavity, between the reservoir and the annular groove and between the groove and the second cavity; and

means connected for responding to an externally produced force for moving one of the pistons, with respect to the other of the pistons for sealingly interrupting fluid communication between the reservoir and the first cavity and for permitting fluid communication between the reservoir and the annular groove and between the annular groove and the second cavity.

3,955,372

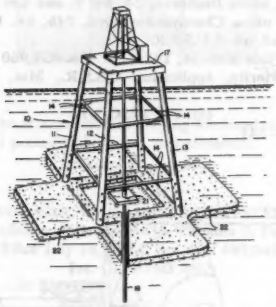
METHOD OF INSTALLING A FIXED MARINE PLATFORM WITH DISPERSED BASE

Ivo C. Pogonowski, Blacksburg, Va., and Paul D. Carmichael, Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 390,805, Aug. 23, 1973. This application Dec. 30, 1974, Ser. No. 537,161

Int. Cl.[2] E02D 21/00

U.S. Cl. 61—46 2 Claims



1. Method for setting a marine structure at an offshore site, said structure having opposed upper and lower ends and a plurality of adjacently positioned support legs depending downwardly therefrom, adapted to be embedded into the floor of a body of water, which method includes the steps of;

providing said marine structure with at least one flexible walled enclosure member supported between at least two of said legs, at a location adjacent to those portions of the structure's lower end which will be embedded into the ocean floor,

forming said flexible walled enclosure member into a compact body and applying restraining means to said body to maintain the shape thereof prior to said structure being positioned at a working site on the ocean floor,

lowering the said structure whereby to embed the lower end thereof into said floor of said body of water, and

introducing a fluidized stream of a hardenable material into said compact body to displace the flexible walls thereof, while said member encloses the fluidized material to confine the latter as it spreads about the ocean floor.

3,955,373

TUNNELLING SHIELDS

Kenneth Gilbert Jessop, Tenterden, England, assignor to Stelmo Limited, Ashford, England

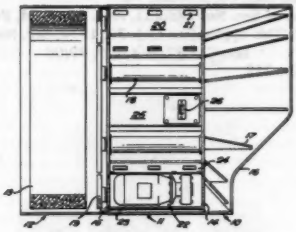
Filed Dec. 7, 1973, Ser. No. 422,811

Claims priority, application United Kingdom, Dec. 8, 1972, 56837/72

Int. Cl.[2] E21D 9/06

U.S. Cl. 61—85 6 Claims

1. In a tunnelling shield including an open-ended generally cylindrical outer wall having circumferentially spaced axially extending strengthening webs and two axially spaced radially inwardly extending annular bulkheads mounted on the inner periphery thereof, a plurality of axially extending rams fixed therein for thrusting against a tunnel lining erected behind or within the rear portion of the shield, a fluid pump, a motor for driving the pump, and at least two fluid reservoirs for supplying fluid under pressure to the rams, the improvement comprising means mounting said fluid pump and said motor on the inner periphery of said shield at the bottom portion thereof and between said two bulkheads, a valve unit including flow control valves for distributing fluid to the rams, said valve unit being mounted at the top of the shield opposite to the pump, a working floor in said shield, said pump and said motor being located beneath said working floor, and means mounting said at least two fluid reservoirs on the inner periphery of the shield located one on each side and on the transverse horizontal



centerline of the shield between said bulkheads whereby said reservoirs, said pump, and said motor counterbalance each other and stabilize said shield about the central longitudinal axis thereof.

3,955,374

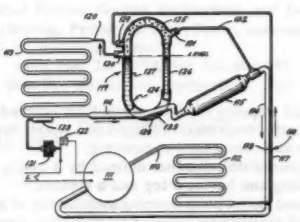
REFRIGERATION APPARATUS AND METHOD

Elmer W. Zearfoss, Jr., 929 Magee Ave., Philadelphia, Pa. 19111

Filed Oct. 23, 1974, Ser. No. 517,141

Int. Cl.[2] F25B 41/06

U.S. Cl. 62—197 18 Claims



1. In a refrigeration system of the type including a compressor, a condenser, a first conduit including a capillary tube, an evaporator, and a second conduit connected in series refrigerant flow circuitry, the improvement comprising control means operable to vary the subcooling of liquid refrigerant caused to flow through said capillary tube to effect changes in flow therethrough, in response to changes in the superheat of gaseous refrigerant flowing from said evaporator, said control means comprising first and second upstanding tube sections having their upper and lower ends in fluid flow communication, said first tube section being provided with an inlet port for refrigerant from said first conduit, said first tube section also being provided with an outlet port disposed to feed liquid refrigerant to said evaporator, said second tube section being adapted for outlet communication at a level above said outlet port with means in heat exchange with said first conduit, and means operable to volatilize refrigerant for flow in said second tube section in response to evaporator superheat, whereby to effect an outflow of liquid refrigerant from said second tube section for the recited heat exchange.

3,955,375

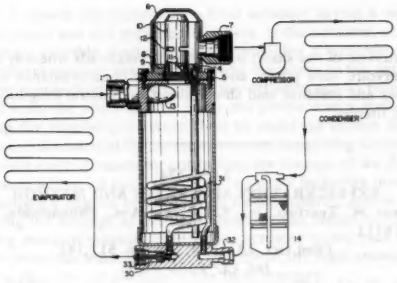
COMBINATION LIQUID TRAPPING SUCTION ACCUMULATOR AND EVAPORATOR PRESSURE REGULATOR DEVICE INCLUDING A CAPILLARY CARTRIDGE AND HEAT EXCHANGER

Ernest W. Schumacher, Portsmouth, Va., assignor to Virginia Chemicals Inc., Portsmouth, Va.

Division of Ser. No. 388,281, Aug. 14, 1974, Pat. No. 3,858,407. This application Oct. 30, 1974, Ser. No. 519,307

Int. Cl.² F25B *43/00*, *49/00*

U.S. Cl. 62—217 3 Claims



1. A liquid trapping suction accumulator adapted for insertion in a vapor-compression refrigeration system between the evaporator and compressor comprising:

A. an accumulator chamber defined by a casing vertically extending and having a top and a bottom;

B. inlet and outlet ports opening into the top of said chamber and respectively adapted for operative connection to said evaporator and said compressor;

C. an evaporator pressure chamber interposed between said inlet and outlet ports in communication with said accumulator chamber said chamber including:

i. a pressure responsive evaporator pressure regulator device, vertically positioned in said evaporator pressure chamber proximate said outlet port so as to gauge admission of vapor from said accumulator chamber into said evaporator pressure regulator chamber and through said outlet;

D. an eductor tube vertically extending independently from the bottom of said accumulator chamber into said evaporator pressure regulator chamber;

E. a capillary cartridge assembly externally supported upon the bottom of said accumulator chamber, said cartridge assembly having an entrance port communicating with a filter drier positioned intermediate said capillary cartridge inlet and said condenser in said system; and,

F. a heat exchanger coil within and proximate the bottom of said accumulator, said coil extending intermediate said capillary cartridge inlet and a capillary within said assembly, said capillary in turn communicating with an outlet extending to said evaporator.

3,955,376

FREEZING PLANT

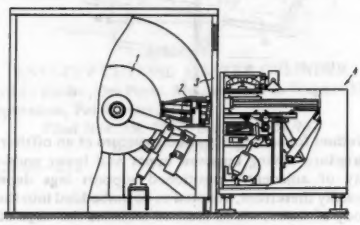
Shimon-Semen Yankelevich Mekenitsky, Novolesnaya ulitsa, 3, korpus 2, kv. 25; Vasily Matveevich Gorbatov, prospekt Mira, 74, kv. 70, both of Moscow; Vladimir Stepanovich Grigoriev, ulitsa Kutuzova, 5, Kaliningrad; Vikenty Petrovich Zaitsev, ulitsa Supruna, 4/10, kv. 27, Moscow; Alexei Grigorievich Ionov, pereulok Engelsa, 6, kv. 4, Kaliningrad; Vyacheslav Ivanovich Khromov, Volgogradsky prospekt, 71, korpus 2, kv. 200, Moscow; Ivan Platonovich Shvachko, ulitsa Dmitrova, 34, kv. 9, and Lev Vasilievich Klimtsov, ulitsa Chernyakhovskogo, 74b, kv. 14, both of Kaliningrad, all of U.S.S.R.

Filed Mar. 28, 1974, Ser. No. 455,960

Claims priority, application U.S.S.R., Mar. 29, 1973, 1899339

Int. Cl.² F25C *5/14*

U.S. Cl. 62—341 3 Claims



1. A freezing plant having cooling plates and a handling device for placing carriers containing a product into a space between said cooling plates and delivers them from this space after the freezing, said handling device comprising: a base, vertically extending guides fixed to said base; a double-deck carriage having a lower deck and an upper deck, said carriage being movably mounted on said guides, the lower deck of the carriage comprising a frame, and the upper deck comprising a platform for receiving the carrier containing the product, horizontally extending guides, bars reciprocatably and rotably mounted on said horizontally extending guides for feeding the carrier containing the product to said platform of the carriage, further translation thereof into the space between said cooling plates and returning the empty carrier back for the loading, and at least one stop located under said carriage serving for expelling the product out of the carrier to said frame of the carriage during the lowering down thereof.

3,955,377

FLEXIBLE COUPLINGS

Wilfrid H. Bendall, 12 Castle Hill Road, Pawcatuck, Conn. 02891

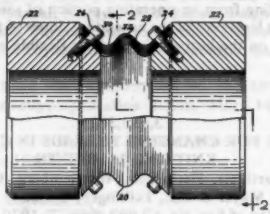
Filed May 6, 1975, Ser. No. 574,925

Int. Cl.² F16D *3/17*

U.S. Cl. 64—11 R 10 Claims

1. A flexible coupling operatively connected to coaxial shaft hub or tubular members for the transmission of power, said coupling comprising an extended length of thin, resilient material of a constant given width formed with a plurality of continuous, transversely spaced uniform corrugations and coiled freely on itself with meshing corrugations to a given radial thickness, the corrugations thereof being in superimposed annular contact with each other at axially spaced lines, said coiled material being operatively connected to the hub members by fastening means extending through the coil and

engaging said members, said coiled material comprising an integral, axially hollow, annularly corrugated flexible coupling



means for the transmission of varying torsional, axial, angular and internal pressures between said members.

3,955,378

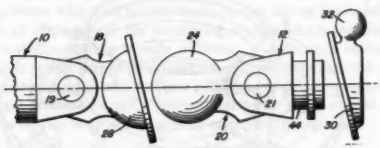
NON-FRICTION COUPLING SYSTEM

Manuel J. Allonca, P.O. Box 4676, Panama 5, Panama

Filed July 16, 1974, Ser. No. 489,042

Int. Cl.² F16D *7/02*

U.S. Cl. 64—30 R **9 Claims**



1. In combination with drive and driven members rotatable about a common rotational axis, a torque transmitting system, comprising a pair of coupling members, a pair of pivot joints connecting said coupling members respectively to the drive and driven members for rotation therewith, universal joint means interconnecting said coupling members in angular relationship to each other for transmitting torque between said drive and driven members, means for axially displacing said pivot joints relative to each other along said common rotational axis to vary the angular relationship between the coupling members, and operating means connected to said axial displacing means for positioning the coupling members in coaxial relationship to the drive and driven members to interrupt transmission of torque therebetween.

3,955,379

HIGH SPEED KNITTING MACHINE

Claude Corbiere, 25 rue St. Andre-Riorges, 42300 Roanne, France

Filed Oct. 10, 1973, Ser. No. 405,088

Claims priority, application France, Oct. 10, 1972, 72.36490

Int. Cl.² D04B *35/00*

U.S. Cl. 66—1 R **21 Claims**

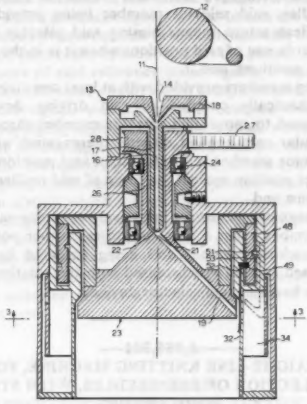
1. A method of cyclically configuring yarn into knitted fabric, comprising the steps of:

pushing the yarn by centrifugal force between a series of elements to form the yarn sequentially into a row of loops which protrude beyond the elements in an initial direction during a first cycle, said series of elements being stationary relative to one another in said initial direction of loop protrusion, wherein each loop has an initial orientation;

holding each loop open progressively;

pushing the yarn during a second cycle to form a subsequent row of loops, wherein each loop in the subsequent row is sequentially inserted through a corresponding loop in the first row while the corresponding loop in the first row is held open;

drawing progressively each of the loops of the first row about the inserted loops to complete successive stitches, wherein the formation of each successive stitch requires a time period approximating the period of one cycle; and



repeating sequentially each of the afore-cited steps to form the knitted fabric of which the loops have formed at a relatively high rate of speed and each stitch formed at a low rate of speed relative to the speed at which the loops are formed.

3,955,380

KNITTING MACHINE PATTERNING DEVICE

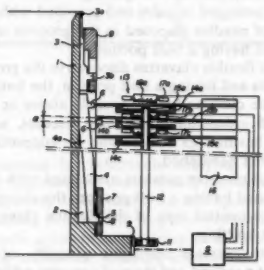
Pierre-Michel Piccino, Geneva, Switzerland, and Juan-Ramon Moreu Orobitg, Premia de Mar, Spain, assignors to Jumberca, S.A., Badalona, Spain

Filed Feb. 22, 1974, Ser. No. 444,899

Claims priority, application Switzerland, Feb. 28, 1973, 2893/73

Int. Cl.² D04B *15/76*

U.S. Cl. 66—50 R **3 Claims**



1. A knitting machine, comprising:

a frame;

a needle bed mounted for rotation with respect to said frame;

a plurality of needles mounted within said needle bed and capable of occupying an operative position and a rest position;

a driving device for said needle bed;

means for moving said needles from said operative position to said rest position and visa versa;

a selector device for positioning said means for moving said needles, comprising:

one selector member fixed to said frame and capable of occupying an operative position wherein said selector member engages said means for moving said needles and an inoperative position wherein said selector member is disengaged from said means for moving said needles, said selector member being provided with resilient return means biasing said selector member towards one of said positions when it is in the other of said positions; and

cocking members provided with at least one circular cam mechanically coupled to said driving device and adapted to move said selector member through said circular cam applied directly thereagainst when said selector member is in said one of said positions to said other position against the force of said resilient return means; and

electromagnetic means for selectively retaining said selector member when it is moved to said other position by said cocking member and being actuated by a programmed control synchronised with the rotation of said needle bed and said selector device.

3,955,381
STRAIGHT-LINE KNITTING MACHINE, FOR PRESELECTION OF THE NEEDLES, WITH STITCH FORWARDING

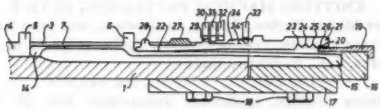
Paul Panchaud, Couvet, Switzerland, assignor to Edouard Dubied et Cie (Societe Anonyme), Couvet, Switzerland

Filed July 12, 1974, Ser. No. 487,967

Claims priority, application Switzerland, July 13, 1973, 10163/73

Int. Cl.² D04B 7/00, 15/66

U.S. Cl. 66—75 R **3 Claims**



1. A rectilinear knitting machine for preselection of the needles with stitch transfer comprising:

needlebeds arranged in pairs and provided with grooves;

a plurality of needles disposed in the grooves of the needlebeds and having a butt portion;

a plurality of flexible clavettes disposed in the grooves of the needlebeds and having a butt portion, the butt portion of the flexible clavette being movable above or below said needlebed independently of said needles, said flexible clavettes having legs at each end for supporting the clavettes in the needlebed;

a plurality of clavette pressers associated with the flexible clavettes and having a butt portion, the clavette pressers engaging a central area of the flexible clavettes not selected for knitting;

said clavette pressers having a plurality of transverse grooves at a second end thereof opposite a first end of the clavette pressers, one of said transverse grooves being placed on a clavette presser support, said clavette presser support having a bulge thereon for engaging one of the transverse grooves in the clavette presser, the selection of one of the transverse grooves controlling the preselection of the clavette presser;

lock means having lock cams for acting on the butt portions of the needles and for action on the butt portions of the flexible clavettes;

a plurality of vertical cams having at least one vertical cam for engaging the clavette presser and driving the butt portion of the flexible clavette into the groove of the needlebed; and

said vertical cams being independent of each other and extending from an operating portion of said lock means over at least part of the ascending slopes of the lock cams acting on the butt portions of the flexible clavettes.

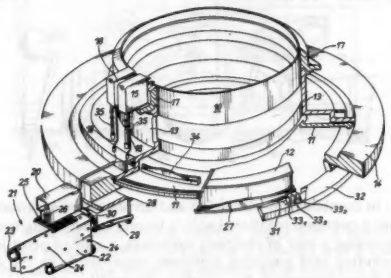
3,955,382
DEVICE FOR CHANGING THREADS IN CIRCULAR KNITTING MACHINES

Johann Martinetz, Hechingen, Wurttemberg, Germany, assignor to Mayer & Cie., Tailfingen, Germany

Continuation of Ser. No. 68,903, Sept. 2, 1970, abandoned. This application Apr. 20, 1973, Ser. No. 353,125

Int. Cl.² D04B 15/60

U.S. Cl. 66—134 **6 Claims**



1. In a circular knitting machine having a rotatable needle cylinder and a plurality of knitting systems, a plurality of thread-changing units each assigned to a knitting system of the machine and each comprising in combination a plurality of thread insertion fingers and a corresponding plurality of means individually associated with said insertion fingers for selectively operating the associated fingers, an electrically operated preselector for each operating means, switching apparatus including programming means having a programmed path for each operating means, the operating means of each thread-changing unit being actuated by one of said electrically operated preselectors when said programming means preselect the corresponding preselector and being mechanically operated in dependence upon said preselector, cam means on the cylinder adapted to coact with the preselector in accordance with the preselection carried out by said programming means, said knitting machine has a frame for rotatably supporting said needle cylinder, and said preselector coacts with said switching apparatus, said switching apparatus is operated by a first trigger cam of said cam means which rotates with the needle cylinder of the machine, exchange apparatus switches arranged on said frame in sequence and corresponding to the number of thread-changing units, and a second trigger cam of said cam means rotating with the needle cylinder of the machine for operating the exchange apparatus switches in sequence.

3,955,383
SIGNAL GENERATOR FOR CIRCULAR PATTERN KNITTING MACHINES

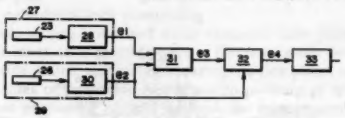
Junzo Hasegawa, Aichi; Susumu Kawabata, Nagoya, and Yasuhiko Suzuki, Nagoya, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Nagoya and Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, both of, Japan

Filed Mar. 5, 1975, Ser. No. 555,435

Claims priority, application Japan, Mar. 14, 1974, 49-29447

Int. Cl.² D04B *15/66*

U.S. Cl. 66—154 A **9 Claims**



1. A synchronizing signal generator for high-speed circular pattern knitting machines comprising a needle synchronizing signal sensing station including a synchronous sensor for producing signals which are synchronized with each of a series of cylinder needles mounted on a needle cylinder, a needle cylinder eccentricity sensing station including a sensor provided in alignment with said synchronous sensor along the axial direction of the cylinder for producing signals which represent the eccentricity of the needle cylinder, a difference operational circuit which supplies difference signals between the needle synchronizing signals and the cylinder eccentricity signals, and a gain control circuit which controls the gains of said difference signals with said cylinder eccentricity signals.

3,955,384
NEEDLE SELECTION CONTROL APPARATUS FOR CIRCULAR PATTERN KNITTING MACHINES

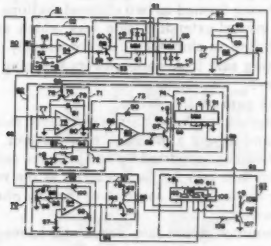
Junzo Hasegawa, Obu; Susumu Kawabata, and Yasuhiko Suzuki, both of Nagoya, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Nagoya and Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, both of, Japan

Filed Mar. 5, 1975, Ser. No. 555,671

Claims priority, application Japan, Mar. 14, 1974, 49-29446

Int. Cl.² D04B *15/66*

U.S. Cl. 66—154 A **29 Claims**



1. An apparatus for electrically controlling needle selector means of high-speed circular pattern knitting machines so that the needle selector means may be actuated by signals supplied by said apparatus for selectively placing a series of cylinder needles mounted on a needle cylinder for axial sliding movement between a knit or operative position and a welt or inoperative position in accordance with programmed knit patterns, said apparatus comprising a needle synchronizing signal sensing station including a synchronous sensor for producing signals which are synchronized with each cylinder needle rotating with said needle cylinder, a pulse shaper circuit which shapes signals supplied by said synchronous station to reference pulse signals, a needle cylinder speed detecting circuit which converts said reference pulse signals to needle cylinder speed signals which represent the corresponding number of revolutions or speed of the needle cylinder, a phase advancer circuit which produces signals whose phases are advanced by said phase advancer circuit in accordance with the increasing speed of the needle cylinder so that the phases may advance the phases of said reference pulse signals, a needle cylinder speed discriminator circuit which compares said needle cylinder speed signals with a previously selected value for selectively supplying high-speed region signals when the needle cylinder is rotating at speeds above said previously selected value and low-speed signals when the needle cylinder is rotating at speeds below said previously selected value, and a signal selector circuit which selectively supplies said signals of the advanced phase to the needle selector means when the needle cylinder is in its high-speed region and said reference pulse signals to the needle selector means when the needle cylinder is in its low-speed region, whereby said needle selector means can be actuated at very high rotating speeds of the cylinder without error.

3,955,385
APPARATUS FOR TREATING TEXTILE WEBS

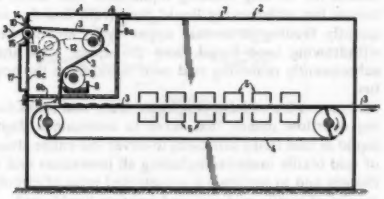
Arno Becker, Freudenstadt, Germany, assignor to Bruckner Apparatebau GmbH, Erback, Odenwald, Germany

Filed July 8, 1974, Ser. No. 486,402

Claims priority, application Germany, July 26, 1973, 7327430

Int. Cl.² D06B *1/14, 21/02*

U.S. Cl. 68—4 **13 Claims**



1. Apparatus for selectively applying or not applying a treatment medium to a continuously movable textile web and for subsequently drying said web, said apparatus comprising a drying housing defining a drying zone containing drying means for said web; a treatment housing defining a treatment zone containing means for applying a treatment medium to said web; an outlet slot in said treatment housing through which said web may leave said treatment housing; means mounting said treatment housing on said drying housing with said zones in communication via said outlet slot; thermal insulating means carried by said treatment housing for insulating the treatment zone from said drying zone; and web deflector means mounted in said treatment zone for engagement with said web and operable to deflect said web as it passes through said treatment zone into positions in which said treatment medium applying means is selectively enabled to apply or disabled from applying such medium to said web.

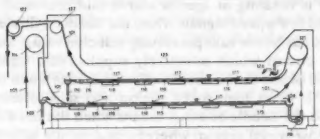
3,955,386
APPARATUS FOR THE CONTINUOUS LIQUID TREATMENT OF RUNNING LENGTHS OF MATERIALS

Christian August Meier-Windhorst, Lindhorst via Hamburg-Harburg, Germany, assignor to Artos Gesellschaft fur Industrielle Forschung und Entwicklung C.A. Meier-Windhorst, Maschen via Hamburg-Harburg, Germany

Continuation-in-part of Ser. No. 136,275, March 16, 1971, abandoned, which is a division of Ser. No. 845,677, July 23, 1969, abandoned. This application Apr. 12, 1974, Ser. No. 461,190

Int. Cl.² D06B *3/20*

U.S. Cl. 68—5 D **8 Claims**



1. Apparatus for the continuous liquid treatment of a running web of textile material comprising, in combination:

a. a lower, shallow, elongated horizontal treatment tank for containing treating liquid;

b. an upper, shallow, elongated horizontal treatment tank for containing treating liquid;

c. means for continuously feeding said web into the apparatus and subsequently into said lower treatment tank;

d. means for continuously withdrawing said web from said lower treatment tank and for subsequently feeding the web into said upper treatment tank;

e. means for continuously withdrawing said web from said upper treatment tank and for subsequently removing the treated textile web from the apparatus;

f. means for feeding treating liquid into said lower tank, means for withdrawing liquid therefrom and for subsequently feeding it to said upper tank, and means for withdrawing used liquid from the upper tank and for subsequently removing said used liquid from the apparatus;

g. said means for withdrawing liquid from said tanks including overflow means that serve to maintain a depth of liquid in said tanks sufficient to cover the entire structure of said textile material including all interstices and voids therein and to maintain a preselected ratio of circulating weight of textile material and treating liquid; and

h. said means (c), (d), and (e) comprising roller means and said means for withdrawing liquid from said tanks including pump means, said roller means and said pump means serving to move the web and the treating liquid through the apparatus at substantially the same speed and in the same direction whereby substantially complete extraction of the treating agent is obtained.

3,955,387
CYLINDRICAL LOCK SET

Walter E. Best, and R. Gene McCullum, both of Indianapolis, Ind., assignors to Best Lock Corporation, Indianapolis, Ind.

Filed Nov. 14, 1974, Ser. No. 523,570

Int. Cl.² E05B *63/10*

U.S. Cl. 70—224 **29 Claims**

1. A cylindrical lock, comprising

a chassis having a hub,

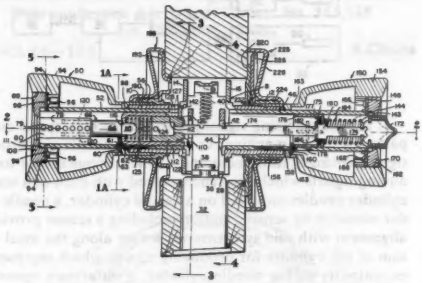
a tubular knob sleeve rotatably mounted in said hub and adapted to receive a key actuated lock core having a cylindrical body containing a key plug and having a pin-tumbler section extending laterally from said body,

said sleeve being of substantially larger diameter than said lock core body and having at its outer end two opposite lengthwise slots, the material between such slots being formed as channel sections each having an outer web portion and side legs bent at an angle to said web portion and extending inward therefrom,

the inner ends of the channel side legs being shaped and positioned to form longitudinal mounting ribs spaced about the axis of the sleeve to slidably receive and support the smaller body of the key-actuated lock core coaxially with the larger sleeve,

at least one of the said slots being shaped to pass the pin-tumbler section of the lock core.

11. A cylinder lock comprising



a chassis having a hub,

a tubular knob sleeve rotatably mounted in the hub and projecting beyond its end,

a knob mounted over the sleeve and hub, said knob having a circular opening in its outer end of substantially larger diameter than said sleeve,

a locating ring engaged about the end of the knob sleeve and within the circular opening of the knob to locate the knob coaxially with the sleeve,

the locating ring having interlocking means, engaged with both the sleeve and knob to key the same to the ring and against relative rotation so as to transmit torque therebetween.

19. A cylindrical lock comprising

a chassis having a hub,

a tubular knob sleeve rotatably mounted in said hub and adapted to receive a key-removable lock core having a body portion of smaller diameter than said sleeve and containing a rotatable key plug, the outer end of said sleeve being formed as two channel sections having elongated, inward-extending side legs which at their inner edges define an elongated cage for slidably receiving and supporting said lock core with its key plug coaxial with the sleeve,

a roll back cam on the sleeve,

a key-actuated roll back carrier rotatably mounted in the sleeve and having a roll back cam thereon,

a throw member supported by and between said key plug at the front and said roll back carrier at the rear for transmitting key-actuated rotation of the key plug to said roll back carrier,

a knob mounted about said sleeve and having a neck telescoped over said hub, a knob keeper mounted in said sleeve adjacent the outer end of said roll back carrier and having a keeper lug engaged with said neck, and a cylindrical shank on said throw member positioned in the path of retraction of said knob keeper to block retraction thereof, and thereby prevent knob removal, the throw member being removable with the key-removable lock core is removed, to thereby allow keeper retraction to release the knob for removal.

20. A cylindrical lock comprising

a chassis having a tubular hub including an out-turned flange at its inner end,

a tubular knob sleeve rotatably mounted in said hub and having an out-turned knob-actuated roll back cam at its inner end bearing against the inner end of the hub,

a key-actuated roll back carrier rotatably mounted in the sleeve and having a key-actuated roll back cam at its inner end,

an out-turned retaining lug on said knob sleeve at a point spaced angularly from said roll back cam thereon and bearing against a face on said hub, said lug and said roll back cam co-acting to retain the sleeve against outward axial pull.

26. A cylindrical lock comprising

a chassis having inner and outer threaded hubs jointed at their inner ends to side plates, a frame member between the side plates, and means securing the side plates against the sides of the frame member with portions of the side plates projecting radially beyond the frame member in spaced relation,

a combined escutcheon and clamp plate threaded on the outside hub and adapted to bear against the outside face of a door,

an inside clamp plate for engaging the inside face of the door and bolts for drawing such plate toward the chassis so as to cause the two clamp plates to be drawn together to clamp the chassis to the door,

locking means acting between the projecting portions of the side plates of the chassis and combined escutcheon and clamp plate to lock the latter against rotation on its hub,

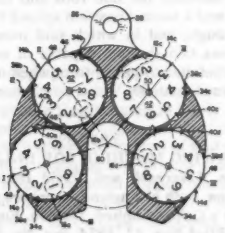
and an inside escutcheon threaded on the inside hub and covering the inside clamp plate,

said locking means comprising a plunger pin slidably mounted in the projecting portions of the side plates and biased toward a locking position of engagement with said combined escutcheon and clamp plate, the latter having an annular series of openings therein into which said plunger pin extends in locking position, and latching means to latch said plunger pin in retracted position to permit free threaded adjustment of said clamp plate to suit the thickness of the door in which the lock is to be installed.

3,955,388
COMBINATION MAGNETIC KEY

Wells F. Stackhouse, Ashville, N.Y., assignor to American Locker Company, Jamestown, N.Y.

Filed June 9, 1975, Ser. No. 585,233
Int. Cl.² E05B *19/18*
U.S. Cl. 70—411 **9 Claims**



1. An adjustable combination key for use with magnetic locks of the general type having magnetically attractable tumbler devices and a contoured surface of a given configuration for positionally locating the key relative to said tumbler devices, which key comprises:

a key body portion formed of a non-magnetic material and having front and rear surfaces connected by a side surface, said front, rear and side surfaces being shaped to define a body portion configuration corresponding to said given configuration whereby to permit said rear surface to be positionally located by said contoured surface, said body portion having a plurality of internal cavities and access openings extending between said cavities and one of said surfaces;

a plurality of combination setting dials formed of a non-magnetic material, each of said dials being supported within one of said cavities for rotation through a plurality of combination setting positions about an axis extending essentially normal to said rear surface, each of said dials bearing indicia indicative of said combination setting positions thereof, said access openings affording access to said dials for permitting manual rotation thereof by an operator of said key;

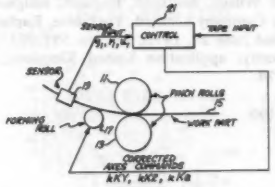
a plurality of magnet devices imbedded one within each of said dials in a radially spaced relationship relative to said axis of its associated dial whereby each of said magnet devices is caused to move about a circular path, as its associated dial is rotated through said combination setting positions thereof; and

means for releasably retaining each of said dials in successive ones of said combination setting positions thereof.

3,955,389
SPRINGBACK COMPENSATED CONTINUOUS ROLL FORMING MACHINES

Gene B. Foster, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 514,504, Oct. 15, 1974, abandoned, which is a division of Ser. No. 383,374, July 27, 1973, Pat. No. 3,854,215. This application Apr. 21, 1975, Ser. No. 569,950
Int. Cl.² B21D *5/14;* **G01B** *5/20*
U.S. Cl. 72—9 **8 Claims**



8. A roll forming machine comprising:

1. a roll forming mechanism including:

a. a pair of pinch rollers for continuously moving a part to be contour formed; and,

b. at least one position adjustable forming roll mounted with respect to said pinch rollers such that the position of said at least one position adjustable forming roll continuously controls the contour of a part continuously moved by said pinch rolls as said part is continuously moved by said pinch rolls;

2. a control system including:

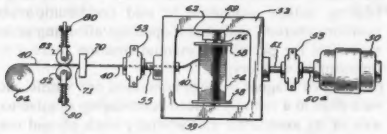
a. axis control means for receiving axis command and controlling the position of said at least one forming roll;

b. manually operated signal modifying means adapted to receive manually inserted springback control signals and connected to said axis controls means so as to modify said axis commands in accordance with said manually inserted springback control signals, and create corrected axis commands, said corrected axis commands being applied to said at least one forming roll so as to continuously control the position of said at least one forming roll as a part is continuously moved through said roll forming machine by said pinch rolls.

3,955,390
TWIST DRAWN WIRE, PROCESS AND APPARATUS FOR MAKING SAME

Arthur L. Geary, Barrington, Ill., assignor to Brunswick Corporation, Skokie, Ill.

Division of Ser. No. 334,223, Feb. 21, 1973, Pat. No. 3,883,371. This application Feb. 25, 1975, Ser. No. 553,022
Int. Cl.² B21D *11/14*; B21C *1/00*
U.S. Cl. 72—64 **2 Claims**

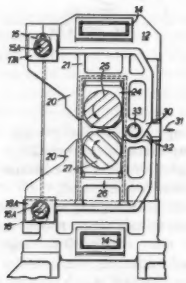


1. A machine combination for increasing the torsional yield strength of a metal wire comprising:
a a yoke having a longitudinal axis of rotation;
b a spool for supporting a coil of wire, said spool rotatably mounted on the yoke and substantially normal to the axis of rotation;
c a die having a reducing zone parallelly alligned with the yoke axis;
d means for rotating the yoke while wire being unspooled from the spool passes through the die; and,
e twist arresting rolls closely adjacent the exit end of the die for preventing plastic twist in the wire after it exits the die, and preventing excess twist accumulation in the wire which will cause failure thereof.

3,955,391
ROLLING MILL

Alexander Ian Wilson, Sheffield, England, assignor to Hille Engineering Company Limited, Yorkshire, England

Filed June 27, 1975, Ser. No. 591,003
Claims priority, application United Kingdom, June 27, 1974, 28576/74
Int. Cl.² B21B *13/20*
U.S. Cl. 72—190 **5 Claims**

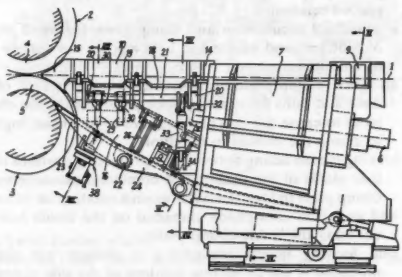


1. A rod or bar mill stand for giving a primary reduction to a workpiece, comprising
a pair of roll mountings;
a pair of co-operative work rolls each carried by a different roll mounting;
a pivotal connection between said mountings on one side of the plane through the axes of said work rolls, permitting relative pivoting of said mountings about an axis parallel to the roll axes;
for each said mounting, support means pivotally connected to a part of said mounting on the other side of said roll axes plane and including means for causing cyclic movement of said part;
whereby the axis of said work roll associated with the support means is constrained to move in a closed path which, over a limited part, approaches the passline of the stand, and
means for driving said rolls about their axes.

3,955,392
DEVICE FOR CHANGING MANDRELS IN TUBE ROLLING MILLS

Maurice Prevot, Aymeries, France, assignor to Vallourec Usines a Tubes de Lorraine-Escaut et Vallourec Reunies, Paris, France

Filed Jan. 6, 1975, Ser. No. 538,934
Claims priority, application France, Jan. 10, 1974, 74.538934
Int. Cl.² B21B *25/06*
U.S. Cl. 72—209 **8 Claims**



1. In a device for mechanically changing plugs in tube rolling mills having opposed rolls for rolling an article advancing along a rolling axis, said device comprising:
a feed trough for tubular bodies to be rolled positioned in alignment with the rolling axis and the end of which adjacent the mill rolls is separated therefrom by a distance greater than the length of plug,
a plug bar projecting into the gap between the mill rolls from the side opposite said feed trough,
means for periodically locating a plug at the start of each pass in alignment with the rolling axis so that the plug may be brought into abutment against said plug bar by a tubular body traveling in the feed trough,
the improvement which comprises movable guide means movable between a first position aligned with the feed trough between the mill rolls and the end of the feed trough and a second position spaced from the axis of the feed trough, and in which said movable guide means comprises two shutters capable of moving toward and away from each other to form when moved toward each other a substantially V-shaped channel.

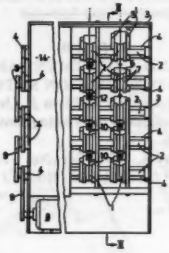
3,955,393
WIRE DRAWING MACHINE FOR IN-LINE OPERATION

James Moss, Liverpool, and David Dutton, Appleton near Warrington, both of England, assignors to British Insulated Callender's Cables Limited, London, England

Filed Nov. 12, 1974, Ser. No. 523,154
Claims priority, application United Kingdom, Nov. 16, 1973, 53461/73
Int. Cl.² B21C *1/04*
U.S. Cl. 72—279 **8 Claims**

1. A wire-drawing machine, suitable for use in-line with an enamelling machine, comprising a plurality of individual wire-drawing capstans mounted for rotation about respective axes in individual bearings, at least one for each capstan, arranged in a substantially planar rectangular array (comprising rows and columns of the capstans) with their said axes aligned with

the rows thereof and driven by a series of parallel drive shafts, each serving all the capstans of one row of the array but separate from those capstans, said capstans of one said column being associated with a single one of a plurality of wire lines whereas said capstans of any one row are associated with a corresponding drawing stage for all said wires lines.

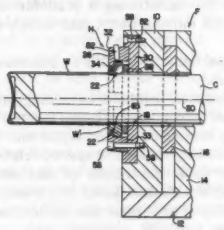


3,955,394

STRIPPING DEVICE FOR IRONING PRESSES

Bruce F. Kaufman, and Stanley J. Miller, both of Hastings, Mich., assignors to Gulf & Western Manufacturing Company (Hastings), Southfield, Mich.

Filed Jan. 9, 1975, Ser. No. 539,733
Int. Cl.² B21D *45/00, 45/06*
U.S. Cl. 72—344 **22 Claims**



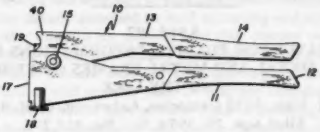
1. A device for stripping a cup-shaped article from the end of a reciprocable ram comprising: stripper member support means having an opening therethrough to freely receive said ram and article, a plurality of stripper members circumferentially spaced apart with respect to the axis of said opening and each having an article engaging end pivotal radially of said opening axis, said stripper member support means including means defining a plurality of separate pockets each receiving a corresponding one of said stripper members in detached relationship with respect thereto, each said pocket alone confining said corresponding one of said stripper members axially, circumferentially and radially with respect to the axis of said opening and for pivotal displacement of said article engaging end of the corresponding stripper member radially inwardly and outwardly relative to said axis, and separate biasing means for each stripper member, said biasing means acting against the corresponding stripper member to bias the article engaging end thereof radially inwardly of said axis of said opening.

3,955,395

RIVET SETTING TOOL

John S. Vecchione, Sturbridge, Mass., assignor to Parker Manufacturing Co., Worcester, Mass.

Filed Mar. 17, 1975, Ser. No. 558,621
Int. Cl.² B21J *15/34*
U.S. Cl. 72—391 **8 Claims**



1. A rivet setting tool for setting a rivet having a mandrel, comprising

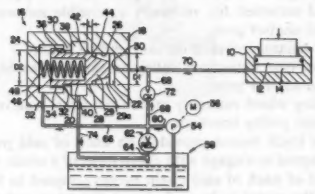
a. a lower handle having an input port,
b. an upper handle,
c. a grasping means operated by movement of the upper handle to cause the mandrel to move along a path passing through the input port, the grasping means, and an exit port in the direction from the grasping means opposite that of the input port,
d. a blocking plate which intersects the path to limit the movement of the mandrel along the path, the blocking plate being adapted so that it can be removed from the path from time to time, but must intersect the path whenever the tool is being operated to set rivets.

3,955,396

PRESS OVERLOAD PROTECTION SYSTEM

Louis F. Carrieri, LaGrange, Ill., assignor to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Oct. 11, 1974, Ser. No. 514,107
Int. Cl.² B21D *55/00*
U.S. Cl. 72—432 **28 Claims**



1. A force overload prevention system for a press comprising, relatively reciprocable piston and cylinder means on said press including a cylinder and a piston in said cylinder and defining a pressure chamber therewith, normally closed relief valve means, said valve means including a pair of separate fluid receiving chambers, fluid outlet means for said receiving chambers and reciprocable fluid pressure actuated valve element means, said valve element means being operable in response to fluid in said receiving chambers at the same given pressure to close said receiving chambers with respect to said outlet means and being operable in response to fluid in one of said receiving chambers at an actuating pressure exceeding said given pressure to open said receiving chambers with respect to said outlet means, a source of hydraulic fluid, hydraulic circuit means including means to deliver fluid from said source to said pressure chamber and said receiving chambers at said given pressure, said piston and cylinder being relatively displaced in response to an overload on said press to increase the fluid pressure in said pressure chamber to an actuating pressure, and said hydraulic circuit means including means between said pressure chamber and said one receiving chamber to increase the pressure in said one chamber to said

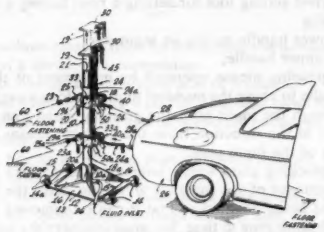
actuating pressure and means to prevent flow of fluid in said circuit at said actuating pressure to the other of said receiving chambers, whereby said valve element means opens said receiving chambers to said outlet means and release of said fluid in said other chamber at said given pressure to said outlet means accelerates opening of said one chamber and dumping of said fluid in said circuit.

3,955,397

APPARATUS FOR PULLING DEFORMATIONS FROM SHEET METAL AND METAL FRAMES OF VEHICLES AND THE LIKE

William J. Meis, 3632 Camerino, Lakewood, Calif. 90712

Filed Apr. 29, 1974, Ser. No. 465,295
Int. Cl.² B21D 1/12
U.S. Cl. 72—442 **6 Claims**



1. Apparatus for pulling deformations from sheet metal, metal frames and the like, which comprises, in combination:

a tubular anchor post;

base means for stably mounting said anchor post on a generally flat surface;

power means mounted within said tubular anchor post and connected to a source of power;

a pulling head, operatively connected to said power means, and mounted for vertically extensible movement above said anchor post;

hook means provided on said pulling head;

at least two main chain pulley brackets releasably affixed to said anchor post;

a pulley wheel rotatably mounted within each of said main chain pulley brackets;

chain track means provided on each of said pulley wheel adapted to engage with chain links of a chain means, one end of each of said chain means adapted to be fastened to the metal to be pulled and the other end of which is adapted to be fastened to said hook means of said pulling head whereby as said pulling head is moved upwardly said chain links of each said chain means enages each of said chain track means and rotates each of said pulley wheels, each of said chain track means comprising, within the circumferential surface of each of said pulley wheels, a series of alternating link recesses and nesting chambers, said chain link recesses and said nesting chambers adapted to receive in nesting fashion successive chain links of said chain means;

a plurality of detent notches provided on at least one face of each of said pulley wheels;

a pivotally mounted detent means, said detent means, in one position engaging successive notches, as each of said pulley wheels are rotated in one direction while preventing rotational movement of said pulley wheels in the opposite direction, said detent means being disengageable from said notches thereby allowing free rotation of the pulley wheels in either direction; and

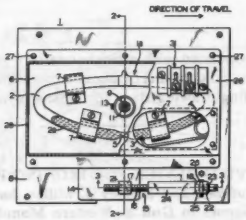
each of said main chain pulley brackets being positioned at different heights on said anchor post and at desired angular directions about said anchor post, an upper one of said main chain pulley brackets carrying its pulley wheel at a point spaced farther from said anchor post than the other of said chain pulley brackets to permit a chain means, engaging a lower pulley wheel, to pass between said anchor post and said upper pulley wheel and engage with said hook means provided in said pulling head.

3,955,398

CALIBRATION AND ADJUSTMENT ARRANGEMENT FOR DECELERATION SWITCH

Paul H. Watson, Ardara, and William J. Linderman, Murrysville, both of Pa., assignors to Westinghouse Air Brake Company, Swissvale, Pa.

Filed May 8, 1975, Ser. No. 575,528
Int. Cl.² G01P 21/00; H01H 35/14
U.S. Cl. 73—1 D **8 Claims**



1. A decelerometer including:

a. switch means for monitoring a predetermined rate of deceleration of a moving body, said switch means comprising:

i. a container partially filled with an electrically conductive liquid; and

ii. a pair of electrical contacts extending into said container, one of said contacts being located so as to be continuously immersed in said liquid and the other of said contacts being located in spaced relation with said liquid under static conditions of said decelerometer and engageable with said liquid only when said decelerometer is subject to at least said predetermined rate of deceleration;

b. a first mounting plate to which said switch means is secured;

c. a second mounting plate to which said first mounting plate is pivotally connected; and

d. adjustment means intermediate said first and second mounting plates for effecting rotation of said first mounting plate about said pivot connection comprising:

i. a first support block on said first mounting plate;

ii. a second support block on said second mounting plate;

iii. an adjusting screw having one end threadedly connected with and extending through said first support block and a shank portion rotatably retained in an opening of said second support block, whereby operation of said screw varies the distance between said first and second support blocks to cause said rotation of said first mounting plate about said pivot connection and to accordingly vary the distance said liquid is spaced from said other of said contacts; and

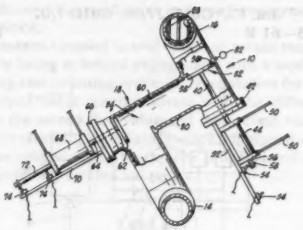
iv. a locking sleeve threadedly connected to the end of said screw so as to engage said first support block and thereby limit rotation of said first mounting plate in a direction which decreases the distance between said liquid and said other of said contacts.

3,955,399

UNI-DIRECTIONAL METER PROVER APPARATUS

Jack R. Neal, Claremore, Okla., assignor to Metric, Inc., Tulsa, Okla.

Filed June 17, 1974, Ser. No. 479,609
Int. Cl.[2] G01F 25/00
U.S. Cl. 73—3 6 Claims



1. A uni-directional meter prover apparatus which comprises:

a. a prover barrel having first and second ends, the first end being positioned below the second end thereof;

b. a piston disposed within said prover barrel which is moved through the barrel by the flow of liquid therethrough;

c. a metered liquid inlet connection attached to the first end of said prover barrel for introducing metered liquid into said barrel and propelling said piston therethrough;

d. a displaced liquid outlet connection attached to the second end of said prover barrel for withdrawing liquid displaced by said piston therefrom;

e. means attached to said barrel for detecting the passage of said piston through said barrel and comparing the volume of liquid displaced thereby with the volume of liquid measured by a meter being proved;

f. a piston transfer conduit connected between said first and second ends of said prover barrel for conducting said piston by gravity movement from the second end of said prover barrel to the first end thereof;

g. first valve means disposed within said transfer conduit for preventing liquid communication between the first and second ends of said prover barrel when closed, but allowing the passage of said piston by gravity movement when opened, said first valve means comprising:

an annular plate sealingly attached within said transfer conduit and positioned transversely to the direction of gravity movement of said piston therethrough, said annular plate including an annular seating surface on the lower side thereof;

a disk closure member positioned below said annular plate within said transfer conduit and including an annular seating surface on the upper side thereof for sealingly engaging the annular seating surface of said annular plate;

an actuating rod attached to said disk closure member; and

actuator means attached to said actuating rod and to said transfer conduit for moving said disk closure member to alternate positions whereby the annular seating surface of said disk closure member sealingly engages the seating surface of said annular plate or whereby said disk closure member is below said annular plate a distance sufficient to allow the passage of said piston therethrough;

h. second valve means disposed within said transfer conduit below said first valve means for retaining said piston when closed, but allowing the passage of said piston by gravity movement when opened, said second valve means comprising:

an annular plate sealingly attached within said transfer conduit and positioned transversely to the direction of gravity movement of said piston therethrough, said annular plate including an annular seating surface on the lower side thereof;

a disk closure member positioned below said annular plate within said transfer conduit and including an annular seating surface on the upper side thereof for sealingly engaging the annular seating surface of said annular plate;

an actuating rod attached to said disk closure member; and

actuator means attached to said actuating rod and to said transfer conduit for moving said disk closure member to alternate positions whereby the annular seating surface of said disk closure member sealingly engages the seating surface of said annular plate or whereby said disk closure member is below said annular plate a distance sufficient to allow the passage of said piston therethrough; and

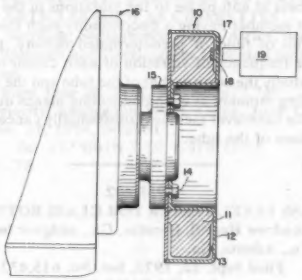
i. means for selectively opening and closing said first and second valve means attached thereto and to said transfer conduit.

3,955,400

VISCOUS DAMPER AND METHOD FOR DETERMINING THE ROTATIONAL POSITION OF A WEIGHT THEREOF

William E. Parker, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 27, 1973, Ser. No. 391,860
Int. Cl.[2] G01P 13/00; G01M 19/00
U.S. Cl. 73—11 12 Claims



1. A torsional vibration engine damper adapted for attachment to the crankshaft of an internal combustion engine comprising

a closed annular housing,

an inertia weight freely rotatably mounted in and relative to said housing in unattached relationship therewith and defining clearances therebetween adapted to retain a damping fluid therein and

indicia means on said weight for indicating the rotational position thereof relative to a specific location on said housing.

8. A method for determining the rotational position of a weight rotatably mounted in a closed opaque housing of a damper comprising the steps of

placing first indicia on said weight,

first sensing the rotational position of said first indicia,

marking the outside of said housing with second indicia to indicate the relative rotational position of said first indicia,

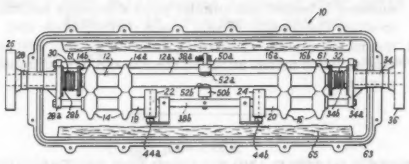
rotating and stopping said housing, and

second sensing the relative rotational positions of said first and second indicia to note any misalignment therebetween.

3,955,401
APPARATUS FOR DETERMINING THE DENSITY OF A FLUID

Reginald Catherall, Woking Surrey, England, assignor to Bell & Howell Company, Chicago, Ill.

Continuation-in-part of Ser. No. 487,386, July 11, 1974. This application Apr. 28, 1975, Ser. No. 571,970
Claims priority, application United Kingdom, July 16, 1973, 33743/73
Int. Cl.² G01N 9/00
U.S. Cl. 73—32 A 29 Claims

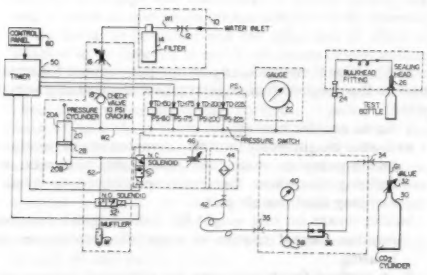


1. Apparatus for determining the density of a fluid comprising a resilient tube, two connecting means secured to the tube at axially-spaced positions along the tube, two substantially identical cantilever members each having one end secured to a respective one of the connecting means and a free end, and means for exciting natural transverse vibrations in the portion of the tube between the connecting means and in the cantilever members in anti-phase to the vibrations in the tube, each cantilever member having a discontinuity such that when the tube is full of fluid of predetermined density, the natural transverse frequency of vibration of each cantilever member is substantially the same as that of the tube and the shear force and bending moment at each connecting means due to vibrations of the cantilever members substantially cancel those due to vibrations of the tube.

3,955,402
PASS LEVEL TESTER FOR GLASS BOTTLES

William Andrew Harvill, Decatur, Ga., assignor to The Coca-Cola Co., Atlanta, Ga.

Filed Sept. 22, 1975, Ser. No. 615,432
Int. Cl.² G01M 3/02
U.S. Cl. 73—37 11 Claims



1. A compact substantially portable system for hydrostatically testing the internal pressure strength of a container automatically at predetermined and adjustable pressure levels comprising:

means for supplying an aqueous liquid into said container;

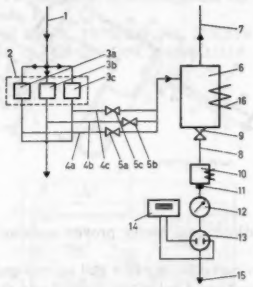
means for pressurizing said aqueous liquid;

pressure control means for automatically changing the pressure of said aqueous liquid in said container in stepped increments to discrete, predetermined and adjustable pressure levels.

3,955,403
METHOD OF AND APPARATUS FOR DETERMINING THE PURITY OF BOILER FEEDWATER

Maurice Bodmer, Nussbaumen, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Aug. 16, 1974, Ser. No. 498,204
Claims priority, application Switzerland, Aug. 24, 1973, 12174/73
Int. Cl.² G01N 27/00; B01D 1/02
U.S. Cl. 73—61 R 12 Claims



1. The method of determining the purity of boiler feedwater occurring as condensate in a steam power station and treated in a condensate polishing plant with at least two filter units for removal of dissolved mineral salts therein which comprises the steps of:

drawing off feedwater from the discharge side of the condensate polishing plant,

concentrating the drawn-off polished condensate to a steady-state condition by partial evaporation of the same in an auxiliary boiler,

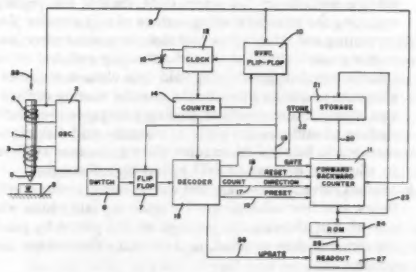
blowing down the concentrated salt-enriched boiler water at a rate which is low in relation to the rate of steam production in the auxiliary boiler, and

measuring the electrical conductivity of the blown down water to determine the mineral content thereof.

3,955,404
RESONANT SENSING DEVICE

Wolf Bickel; Ulrich Eichert, both of Cologne, and Ludwig Niklas, Lovenich, all of Germany, assignors to Krautkramer-Branson, Incorporated, Stratford, Conn.

Filed Oct. 15, 1974, Ser. No. 514,704
Claims priority, application Germany, Nov. 15, 1973, 2357033
Int. Cl.² G01N 29/00
U.S. Cl. 73—67.2 9 Claims



1. A resonant sensing device for determining the property, such as hardness, of a workpiece comprising:

an elongate transducer adapted to be resonant and having a workpiece engaging tip at one end;

oscillator means coupled to said transducer for rendering said transducer resonant;

counting means coupled to said transducer for providing and storing a first value commensurate with the resonant frequency of said transducer when said tip is free of engagement with a workpiece and for providing a second value commensurate with the resonant frequency of said transducer when said tip is in forced engagement with a workpiece;

control means coupled to said counting means responsive to said tip being in forced engagement with a workpiece for causing said counting means to be operative for providing an output value commensurate with the difference between the stored first value and the second value, and

means for receiving said output value and transforming it to a value related to the workpiece property and indicating such property related value.

3,955,405

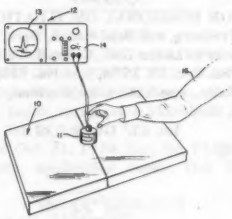
ULTRASONIC NDT SYSTEM WITH FLASHING DISPLAY ALARM

John W. Couture, Brookfield Center, Conn., assignor to Automation Industries, Inc., Los Angeles, Calif.

Filed Dec. 7, 1973, Ser. No. 422,834

Int. Cl.² G01N *29/04*

U.S. Cl. 73—67.7 **4 Claims**



1. An electronic testing apparatus of the type including a search unit which responds to ultrasonic test waves in a test material to produce electrical test signals, comprising:

cathode ray oscilloscope display means having beam deflection means and beam intensity control means, said deflection means being connected to receive said electrical test signals from said search unit for displaying such signals on a screen of said cathode ray tube;

threshold level signal detection means connected to receive said electrical signals from said search unit to detect the presence of electrical signals exceeding a predetermined level; and

flashing screen generator means connected between said detection means and said beam intensity control means of said display means to cause said beam to fluctuate in intensity in response to the occurrence of an electrical test signal exceeding said threshold level, whereby a flashing display is produced on said display means as an alarm or warning signal,

said threshold level detection means includes,

test signal gating circuit means connected to receive said electrical test signals from said search unit and to pass selectively timed portions thereof,

peak signal detector means connected to said test signal gating circuit means for assuming a signal level corresponding to the peak values of those portions of test signals passed by said gating circuit means, and

level monitor circuit means connected to said peak signal detector means and having first and second states, said monitor means normally being in its first state and assuming said second state only in response to the signal level of said peak signal detector means assuming a predetermined threshold magnitude, and

said flashing screen generator means including,

oscillator means,

flashing screen gating circuit means having inputs connected to said level monitor means and said oscillator means and having an output connected to said beam intensity control means for causing said beam to vary in intensity in response to said oscillator means, only during the second state of said level monitor means

said cathode ray tube display means further includes a sweep generator means connected to said deflection means together with said signal from said search unit for causing the electron beam to sweep across the screen of said display means simultaneously with a change in beam position caused by the test signal,

said sweep generator means having blanking signal means for connection to said beam intensity control means, and

said flashing screen generator means further comprising a blanking override gating means connecting said blanking signal means from said sweep generator and the output of said flashing screen gating means to said beam intensity control means, whereby the alternating signal output from said flashing screen gating means during the second state of said level monitor means overrides the normal blanking operation of said cathode ray tube display means and causes the display on said screen to flash on and off as said alarm or warning signal.

3,955,406

NON-DESTRUCTIVE HARDNESS TESTING OF ARTICLES SUCH AS CIGARETTES

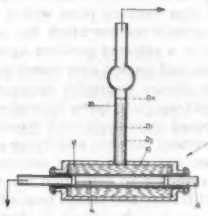
Mauritz L. Strydom, Stellenbosch, South Africa, assignor to Tobacco Research and Development Institute Limited, Zug, Switzerland

Filed June 10, 1974, Ser. No. 477,749

Claims priority, application South Africa, June 12, 1973, 73/3954; Jan. 31, 1974, 74/0651

Int. Cl.² G01N *3/10;* G01B *13/08*

U.S. Cl. 73—78 **2 Claims**



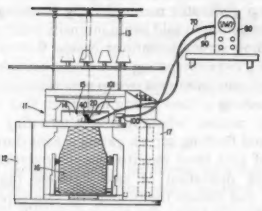
1. Apparatus for the testing of a compressible article, comprising a chamber for containing a liquid, an elastic sleeve fluidtightly spanning the chamber and adapted slidably to receive the article therein, one end of the sleeve being open, means to close off the other end of the sleeve, a plurality of gauge tubes in communication with the interior of the chamber and extending upwardly from the chamber, a liquid filling the chamber outside the elastic sleeve and partially filling the gauge tubes, means to shut off different gauge tubes from the chamber when different degrees of suction are applied to the interior of the sleeve and means to withdraw air through said open end of the sleeve so that when an article is inserted into the sleeve and air is withdrawn from the sleeve, the sleeve compresses the article and contracts and the level of liquid in any gauge tube in communication with the chamber falls to indicate the volumetric change in the article.

3,955,407

METHOD AND APPARATUS FOR TESTING KNITTING MACHINES

Lawrence Rozett, Flushing, N.Y., assignor to The Singer Company, New York, N.Y.

Filed Apr. 29, 1975, Ser. No. 572,782
Int. Cl.² G01B 7/18
U.S. Cl. 73—88.5 R 2 Claims



1. Testing apparatus for a knitting machine of the type having a frame and a slotted needle bed shiftable relatively to each other, knitting needles endwise reciprocative in said needle bed slots, means associated with said knitting needles for reciprocating said needles and including butts projecting from said bed slots, said testing apparatus comprising a section block adapted to be positioned on said frame adjacent to said needle bed, angled cam means arranged on said section block for operative engagement with said needle reciprocating butts, means including a cam back-up plate with a cam engaging surface arranged on said section block for supporting said angled cam means in a selected position against the forces transmitted between said angled cam means and said needle reciprocating butts during operative engagement therebetween, said cam back-up plate being formed with a cam engaging surface disposed at an angle with respect to the direction of relative movement between said frame and said slotted needle bed, at least one strain gauge secured to said cam back-up plate fo. response to deflection thereof incident to transmission of said forces, and means responsive to the output of said strain guage for providing a measurable indication of the forces transmitted between said needle reciprocating butts and said angled cam means.

3,955,408

FLUIDLESS BOTTLE TESTING METHOD AND APPARATUS

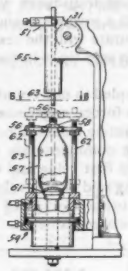
John D. Northup, 2460 Underhill Road, Toledo, Ohio 43615

Filed Sept. 8, 1975, Ser. No. 611,530
Int. Cl.² G01N 3/00
U.S. Cl. 73—94 9 Claims

8. A method for testing the bottom, bearing surface and lower portion of the side wall of a glass container, comprising the steps of:

supporting the container peripherally without contacting either of the bottom or the bearing surface; and

applying a predetermined force against the inside central bottom of the container over a predetermined area thereof, thereby developing a tension stress in the outside



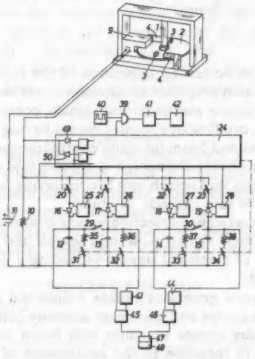
surfaces of the bottom, bearing surface and lower side wall and causing failure if significant defects are present.

3,955,409

DEVICE FOR TORSIONAL OSCILLATION TESTING

Kurt Moser, Freiburg, and Beat Höchli, Bern, both of Switzerland, assignors to Lonza Ltd., Gampel, Valais, Switzerland

Filed Dec. 19, 1974, Ser. No. 534,450
Claims priority, application Switzerland, Dec. 21, 1973, 17999/73
Int. Cl.² G01N 3/32
U.S. Cl. 73—99 7 Claims



1. In a device for the torsional oscillation testing of test bodies, especially of plastic test bodies, of the type wherein a torsional pendulum with the test body can be made to undergo damped torsional oscillation, and having a transducer for producing a potential corresponding to the torsional oscillation, means connected to the transducer to measure the duration of oscillation and means for measuring the damping with peak-value stores, which are connected to the transducer by a switch controlled by the oscillation, the improvement comprising:

first, second, third and fourth series circuits, each including a condenser and a half-wave rectifier, said rectifiers in said first and third circuits being polarized oppositely to those of the second and fourth circuits;

first, second, third and fourth switches for coupling the respective series circuit in parallel connection to said transducer;

first, second, third and fourth auxiliary circuits each being coupled to a respective rectifier, each for supplying a signal when a potential arises in the blocking direction of its respective rectifier;

a control circuit, responsive to said signals from said auxiliary circuits, said control circuit causing a damped oscillation of said pendulum and, afterwards, connecting the first series circuit to the transducer, and, after the occurrence of a signal in one of the auxiliary circuits, connects the next series circuit to the transducer;

a time pulse emitter;

an impulse counter;

a gate responsive to said time pulse emitter and coupled to said impulse counter, said gate opening upon the occurrence of a signal from the auxiliary circuit of the first series circuit and closing upon the occurrence of a signal from the auxiliary circuit of a different series circuit; and

a calculator, responsive to signals from said condensers in said series circuits, said calculator inverting the charging potential of the condensers of the second and fourth series circuits and dividing the sum of the charging potential of the condenser of the first series circuit and the inverted charging potential of the second condenser by the sum of the charging potential of the condenser of the third series circuit and the inverted charging potential of the fourth condenser to determine the damping factor.

3,955,410

METHOD FOR MEASURING A DRIVING POWER BY MEANS OF AN INDUCTION MOTOR

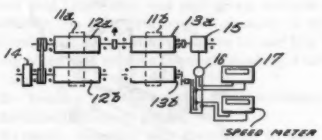
Takeshi Wakabayashi; Kiyoshi Takatsuka, and Akira Takagi, all of Nagoya, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 21, 1974, Ser. No. 516,803

Claims priority, application Japan, Oct. 25, 1973, 48-120145

Int. Cl.² G01L 5/13

U.S. Cl. 73—133 R **1 Claim**



1. A method of measuring the driving power of a power drive by employing an induction motor of the type having a characteristic curve which is linear within a region which includes the rated speed of the motor, comprising the steps of:

coupling the power drive to said motor to rotate the motor within said region at a speed higher than its rated speed;

applying current to said motor to maintain the rotational speed of the motor constant within said region; and

measuring voltage, current and speed of the motor during the period that the rotational speed of the motor is constant.

3,955,411

METHOD FOR MEASURING THE VERTICAL HEIGHT AND/OR DENSITY OF DRILLING FLUID COLUMNS

Ernest E. Lawson, Jr., Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

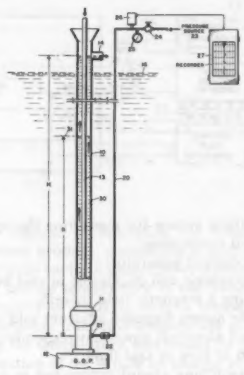
Filed May 10, 1974, Ser. No. 469,139

Int. Cl.² E21B 47/04

U.S. Cl. 73—155 **2 Claims**

1. A method for measuring the vertical height of a drilling mud column formed in a riser pipe during offshore drilling operations in which said riser pipe extends from adjacent the sea floor to the surface of the water and said mud column is formed in said riser by drilling mud which is pumped down the drill pipe and up the annulus between the drill pipe and the riser during such drilling operations comprising the steps of:

remotely determining at the surface of the water the pressure of the drilling mud column in the riser at a level below the drilling mud returns outlet;



said drilling mud column pressure being convertible to the vertical height of the drilling mud column in said riser above said level;

said pressure determinations being made by injecting liquid through a tube which extends from above the surface to the pressure determining level of said drilling mud column at a pressure which when added to the hydrostatic pressure of the liquid in said tube at said level is about the same as the pressure of said drilling mud column at said level, said pressure determinations being recorded versus time.

3,955,412

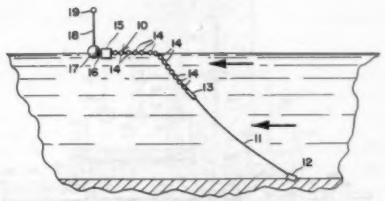
WATER CURRENT FORCE MEASURING APPARATUS

Shale J. Niskin, 2941 Lucaya St., Miami, Fla. 33133

Filed Apr. 1, 1974, Ser. No. 456,729

Int. Cl.² G01D 3/00; 43 44.98

U.S. Cl. 73—170 A **7 Claims**

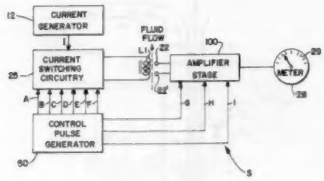


1. Apparatus for determining the kinetic energy of currents and the like comprising substantially elongated drag inducing means, means secured at one end for anchoring said drag inducing means in said current, force indicating means secured to the other end thereof, and float means secured to said force indicating means whereby said float means may counterbalance the drag forces effected by said current on said drag inducing means and said force indicating means recording said drag forces, when said apparatus is placed in water of less depth than the length of the drag inducing means.

3,955,413
ELECTRICAL SYSTEM FOR ELECTROMAGNETICALLY MEASURING FLOW OF FLUID

James R. Steele, 16261 Itasca St., Sepulveda, Calif. 91343, and James Susumi Imai, 2801 Sixth Ave., Los Angeles, Calif. 90018

Filed Mar. 27, 1974, Ser. No. 455,196
Int. Cl.² G01F 1/58
U.S. Cl. 73—194 EM 9 Claims

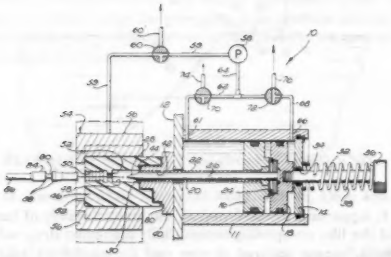


1. An electrical system for measuring the speed of flow in a body of fluid comprising:
an electric current generator;
an electromagnetic coil disposable in said body of fluid for establishing a magnetic field therein;
an electrode means disposed adjacent said coil for picking up desired electrical signals corresponding to changes in the speed of flow of said fluid;
a current switching circuit connected in circuit between said current generator and said coil for cyclically reversing flow of current through said coil to reverse polarity of said magnetic field cyclically; said current switching circuit comprising a capacitor means connected in circuit with said coil for storing energy during one half cycle when current in said coil is reversed and for returning the stored energy to said coil during the next half cycle after the current is reversed thereby increasing the magnitude of the magnetic field established by said coil; and
a control pulse generator connected in circuit with said current switching circuit for applying control pulses thereby to reverse cyclically said flow of current.

3,955,414
CONTACT INSERTION APPARATUS

Randy H. Anderson, Brea, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Feb. 18, 1975, Ser. No. 550,360
Int. Cl.² H01R 43/00
U.S. Cl. 29—203 B 1 Claim

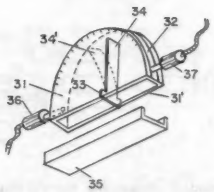


1. An apparatus for facilitating the insertion of an electrical contact into a bore in an electrical connector insulator comprising:
a cylinder having front and rear walls;
front and rear pistons slidable in said cylinder between said front and rear walls;
an opening in said front wall;
means for mounting said insulator adjacent to said front wall with said bore therein aligned with said opening;
a sleeve connected to said front piston and extending forwardly through said opening in sliding relationship therewith;
a pin slidable in said sleeve, said pin having a forward pointed end, the rear end of said pin being connected to said rear piston;
spring means biasing said rear piston rearwardly toward said rear wall;
pneumatic control means for shifting said pistons rearwardly in said cylinder toward said rear wall to a first position wherein said forward pointed end of said pin projects forwardly of the forward end of said sleeve;
said pneumatic control means shifting said pistons together forwardly in said cylinder toward said front wall to a second position to push said sleeve and pin through said insulator bore;
said pneumatic control means and said spring means cooperating to cause said rear piston to shift rearwardly relative to said front piston to a third position, in said third position of said pistons said forward pointed end of said pin being retracted rearwardly in said sleeve to be spaced behind the forward end of said sleeve allowing a contact to be inserted thereinto; and
said pneumatic control means shifting said front piston rearwardly in said cylinder to return said front piston to its said first position to withdraw said sleeve from said bore bearing said contact in said bore.

3,955,415
FLOWMETER

Benjamin Sharon, Rehovot, Israel, assignor to Yeda Research & Development Co. Ltd., Rehovot, Israel

Filed Mar. 3, 1975, Ser. No. 555,173
Claims priority, application Israel, Mar. 8, 1974, 44374
Int. Cl.² G01F 1/28
U.S. Cl. 73—228 6 Claims



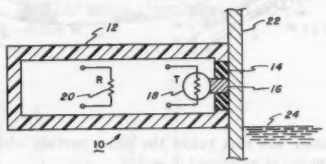
1. A flowmeter for the quantitative measurement of small rates of flow of fluids flowing through the flowmeter, comprising:
a hermetically sealed housing having two parallel walls facing each other, at least one of these being transparent;
a scale being provided on a transparent wall;
a thin vane made of flexible, resilient material positioned so as to divide the said housing into two parts, one end of said vane being non-rotatably attached to the housing;
inlet means being provided in a sidewall of one of these parts; and
outlet means being provided in a sidewall of the other part of the housing;
said vane being of an area substantially equal to the cross-section of the housing where said vane is located in its rest position,
whereby the rate of flow is indicated by the deflection of the edge of the flexible vane due to the bending thereof in the fluid flow.

3,955,416

THERMAL LIQUID LEVEL DETECTOR

William Paul Waiwood, Seven Hills, Ohio, assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jan. 30, 1975, Ser. No. 545,503
Int. Cl.² G01F 23/22
U.S. Cl. 73—295 13 Claims



1. A thermal level detecting system comprising, in combination:

a probe adapted for coupling to a vessel having a substance disposed therein, said probe having a given external surface adapted for thermal coupling to said substance and wherein the level of said substance may vary relative to said given external surface whereby the relative thermal coupling between said substance and said given external surface varies between minimum and maximum values;

a thermistor disposed within said probe and thermally coupled to said given external surface of said probe wherein a low thermal resistance and capacity path is provided between said thermistor and said given external surface and wherein the effective thermal capacity of said thermistor increases substantially relative to said low thermal capacity when said relative thermal coupling is said maximum value;

means for heating said thermistor in accordance with a predetermined series of pulses;

means thermally coupling said thermistor to said heating means so that the electrical resistance of said thermistor changes in correspondence with each of said pulses; and,

means for detecting said electrical resistance changes to provide an output signal.

3,955,417

GREASE THERMOPARTICULATING COATING

James D. B. Smith, Turtle Creek; David C. Phillips, Pittsburgh, and Kenneth W. Grossett, Murrysville, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 15, 1975, Ser. No. 568,223
Int. Cl.² G01K 13/02
U.S. Cl. 73—339 R 19 Claims

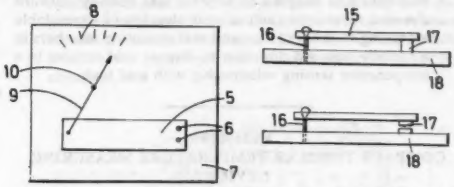
1. A method of protecting electrical apparatus from damage due to overheating, said apparatus including a gas stream and a monitor for detecting particles in said gas stream and for emitting a signal when said particles are detected, comprising applying to said electrical apparatus at positions exposed to said gas stream a grease which comprises a telomer of polytetrafluoroethylene and a perfluoroalkyl polyether, and monitoring said gas stream for the presence of particles therein.

3,955,418

TEMPERATURE INDICATORS

Roger Lindsay Hand, Bramhall, England, assignor to Imperial Chemical Industries Limited, London, England

Filed July 31, 1973, Ser. No. 384,392
Claims priority, application United Kingdom, July 31, 1972, 35638/72
Int. Cl.² G01K 3/04, 5/56, 5/62, 11/08
U.S. Cl. 73—339 R 7 Claims



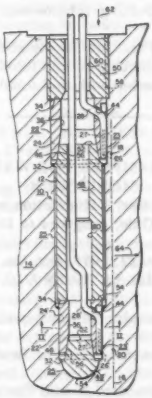
1. A device capable of indicating the time/temperature history of a frozen product, comprising a strained article of elastomeric material having a glass/rubber transition temperature above the storage temperature of the frozen article and having the property of relaxing over a temperature range below the glass/rubber transition temperature at a rate which is dependent on the temperature, and means for indicating the amount of relaxation of the article on change of temperature through the glass/rubber transition temperature, whereby said means indicates the time/temperature history of the frozen product.

3,955,419

MULTIPLE SENSOR TEMPERATURE MEASURING DEVICE

Serge P. Barton, Wallingford, and Louis Sangiorgio, Broomall, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 20, 1974, Ser. No. 481,269
Int. Cl.² G01K 1/14, 7/00
U.S. Cl. 73—340 11 Claims



1. A device for measuring temperatures at a predetermined plurality of points along a line of investigation within a body, said device comprising:

a plurality of temperature sensors, each of said plurality of sensors corresponding to one of said predetermined points,

a plurality of expandable mounting members, each mounting member having a first end and a second end thereon, each mounting member having one of said sensors mounted thereon, and,

a plurality of spacer members disposed so that each first end and each second end of each of said plurality of expandable mounting members is adjacent to one of said spacers,

said spacer members adapted to translate a force exerted along an axis extending through said device into a force directed radially outward relative to said axis, said spacer members also adapted to impress said radially outward directed force into each of said plurality of expandable mounting members to expand said mounting members in a radially outward direction to dispose said sensors in a temperature sensing relationship with said body.

3,955,420

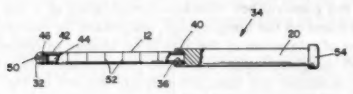
COMPACT TUBULAR TEMPERATURE MEASURING DEVICE

Robert Parker, Danville, Calif., assignor to RPR, Inc., Dublin, Calif.

Continuation-in-part of Ser. No. 475,548, June 3, 1974, abandoned. This application Aug. 12, 1974, Ser. No. 496,416

Int. Cl.² G01K *11/12*

U.S. Cl. 73—356 **13 Claims**



1. A portable apparatus for rapid measurement of and elevated temperature surface which comprises:

a graduated heat-conducting thin-walled tubular member defining an inner chamber and having a dark outer surface coated with at least one liquid crystal composition for indicating temperatures by a color changed in a selected temperature range;

at one end of said tubular member, a rounded heat transfer tip in heat-conducting relationship with said tubular member; and

at the other end of said tubular member, a heat sink member operably connected to said tubular member in heat-receiving relationship with said tubular member.

3,955,421

PERIPHYTON SAMPLER FOR WATER QUALITY MONITORING

Robert J. Doernberg; Earl J. Huddleston, and James F. Mariol, all of Cincinnati, Ohio, assignors to Design Alliance, Inc., Cincinnati, Ohio

Filed Mar. 27, 1975, Ser. No. 562,461

Int. Cl.² G01N *1/10*

U.S. Cl. 73—421 R **30 Claims**

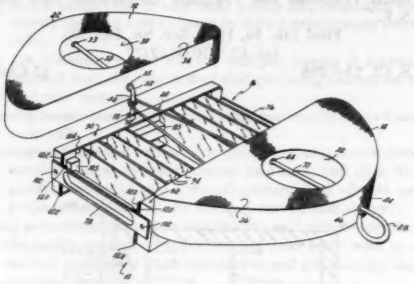
1. A periphyton sampler for water quality monitoring comprising, in combination:

a pair of floatation members for floating the sampler in water;

a bail pivotally connected to said floatation members on a pivot axis passing through said members for connecting and also separating both said floatation members;

a slide holder adapted to hold a plurality of slides, said slide holder having a slide-holding position whereat slides are securely held thereby and a slide-releasing position whereat slides are easily removed from said slide holder; and

the portion of said bail located between said floatation members being operative with said slide holder to support said slide holder below said pivot axis so that said slide



holder will sink below the water surface whenever the sampler is immersed in water.

3,955,422

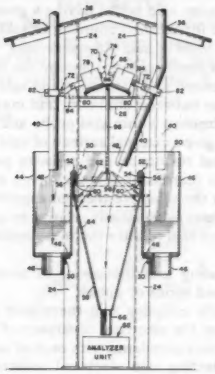
SAMPLE SELECTOR APPARATUS AND METHOD

Robert D. Currie, Anaconda, Mont., assignor to The Anaconda Company, New York, N.Y.

Filed Nov. 21, 1974, Ser. No. 525,817

Int. Cl.² G01N *1/20*

U.S. Cl. 73—423 R **8 Claims**



1. An automatic sample selector apparatus having a support means and being adapted to use in selectively abstracting samples to be examined comprising delivery means supported by the support means including a plurality of movable delivery members for discharging flowable material, receiving means operatively connected to the support means for receiving and directing the flowable material, collection means connected to the support means for selectively receiving flowable material, said receiving means including a plurality of stationary receptacles spaced adjacent each other and said collection means being generally centrally located with respect to said receptacles such that said receptacles generally surround said collection means, control means being operatively connected to said delivery means for selectively moving the delivery member towards and away from said collection means and said receptacles so as to selectively enable the delivery member to discharge the flowable material into said collection means for enabling the discharged material to be subsequently exam-

ined, and means operatively connected to said control means and being energizable by said control means to discharge a cleaning fluid to said collection means for cleaning said collection means of accumulated impurities.

3,955,423

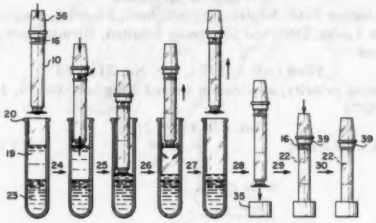
LIQUID SAMPLING METHOD

Philip Ohringer, Melville, N.Y., assignor to Marvin Padover, Huntington, N.Y., a part interest

Continuation-in-part of Ser. No. 290,039, Sept. 18, 1972, Pat. No. 3,846,077. This application Sept. 27, 1974, Ser. No. 510,094

Int. Cl.² B01D *33/00;* **B01L** *11/00*

U.S. Cl. 73—425.4 R **11 Claims**



1. A method for isolating a liquid sample from a specimen container using a collection tube having a diameter smaller than the container and including an aperture formed at one end of the collection tube, and a flexible circular disc formed adjacent to the aperture comprising the steps of:

inserting the collection tube into the specimen container so that the flexible disc forms a seal against the walls of the container;

collecting a predetermined amount of liquid sample flowing through the aperture into the collection tube;

withdrawing the tube from the container with the collected specimen;

inverting the tube with a sample measuring cup installed on the end of said tube opposite to the collected sample to deposit the measured sample in said cup;

installing said sample measuring cup on said tube prior to the inverting step.

3,955,424

INTEGRAL MECHANICAL GOVERNOR

John G. Williams, Warren, N.J., assignor to Turbodyne Corporation, Wellsville, N.Y.

Filed Mar. 10, 1975, Ser. No. 556,654

Int. Cl.² G01P *3/16, 15/02*

U.S. Cl. 73—535 **14 Claims**

1. An integral mechanical governor for use with a prime mover having a rotatable shaft thereon;

a. a housing forming a governor chamber and a lubricating fluid sump and having at least one open end, and closure means detachably connected to the open end thereof,

b. means on the inboard end of the housing remote from the open end for connecting the mechanical governor in assembled position on the prime mover,

c. bearing means in the end wall of the housing on the inboard side thereof,

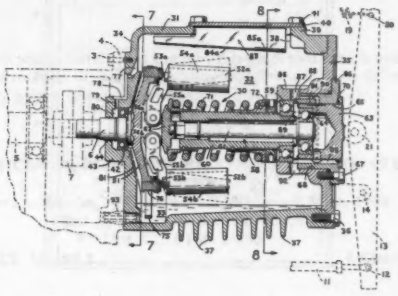
d. a driven shaft rotatably mounted in said bearing means and extending in the axial line of the housing from the interior of the governor chamber in said housing to the exterior of the housing to permit the driven shaft to be coupled to the shaft of the prime mover,

e. governor weight holder means fixedly connected to the end of the driven shaft in the governor chamber and rotatable therewith, and weight means pivotally connected to the governor weight holder,

f. outboard bearing means connected in said end closure in the axial line of said inboard bearing means,

g. a governor assembly mounted in said housing and having means thereon slideable in said outboard bearing responsive to the movement of the weight means during rotation of the driven shaft, and

h. lubrication means in said housing including, an oil ring rotatably connected to the governor assembly and disposed relative said lubrication sump whereby on rotation of said driven shaft lubricant will be thrown and distributed to the upper portion of said governor assembly chamber, and



i. means in said housing for distributing lubricant from said lubricating fluid sump to the inboard bearing, the outboard bearing and said governor assembly,

j. said means for distributing lubricant to the inboard bearing includes,

1. the inboard end wall having a collecting chamber formed thereon,

2. said inboard end wall having an inboard bearing lubrication chamber formed therein in communication with the inboard bearing,

3. passage means connecting the collecting chamber to the inboard bearing lubrication chamber, and

4. means for returning lubricant from said inboard bearing lubricating chamber to said lubricating fluid sump.

3,955,425

PIPE WALL THICKNESS GAUGE

George E. Corneau, Central Falls, R.I., assignor to Indev, Inc., Pawtucket, R.I.

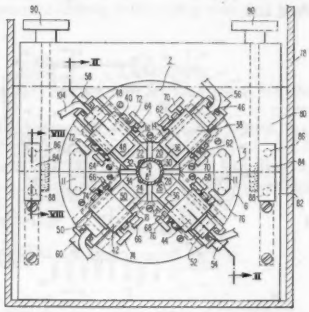
Filed Aug. 16, 1974, Ser. No. 497,947

Int. Cl.² G01N *29/00*

U.S. Cl. 73—552 **1 Claim**

1. In a pipe wall thickness gauge including at least one wall thickness indicator consisting of an acoustic signal generator, a sensor for receiving reflected acoustic signals, a common generator-sensor housing and electronic time differentiation and indication means electrically connected to said generator and to said sensor for determining the time delay between two acoustic signal reflections from the inside and the outside of the wall of a pipe and converting said time delay into a signal proportional to the wall thickness of said pipe, the improvement comprising: a gauge base adapted to surround circumferentially a pipe located along the axis of said gauge, said base consisting of at least two separable sectors, each of which subtends an arc of no more than 180° around said axis, each of said sectors including at least one pipe positioning member with pipe centering elements at the tips thereof pointed radially inward toward said axis, all of said positioning and centering elements being adapted to maintain a pipe in a position along said axis, at least one of said pipe positioning members

including means for holding said generator-sensor housing in a precisely predetermined position relative to a pipe maintained in a position along said axis by said positioning and centering elements, said generator-sensor housing holding means projecting from said pipe positioning member in a direction parallel to said axis, said holding means further including adjustment means for adjusting the position of said acoustic signal generator and said sensor relative to said pipe positioning member, in the radial direction, in the direction perpendicular to said radial direction in a plane perpendicular to said axis, and in angular inclination relative to a plane perpendicular to said axis, said generator-sensor holding



means consisting of a generator-sensor housing retainer having flat side walls and adjacent flat surfaces forming an angle therewith, said retainer being enclosed by a holder having mating flat side walls, a pivotal attachment securing each of said holder side walls to said mating retainer side walls at a point, said generator-sensor housing being located between said pivotal attachment points, the opposite said holder side walls each including a threaded adjustment screw having a camming tip in contact with one of said inclined plane surfaces of said retainer, one of said screws being located closer to said axis and the other further away from said axis than the center of said generator-sensor housing.

3,955,426

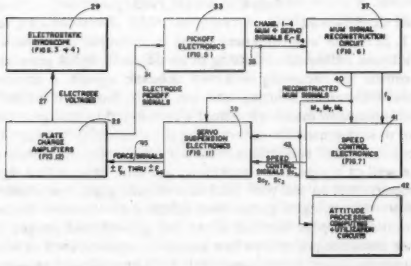
MASS UNBALANCE MODULATION PICKOFF ATTENUATION AND SPEED CONTROL IN ELECTROSTATIC GYROSCOPE SYSTEM

John F. Klinchuch, Orange, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed June 19, 1974, Ser. No. 480,786

Int. Cl.² G01C *19/28*

U.S. Cl. 74—5.6 D **14 Claims**



1. In a suspension and position indicating system for an electrostatic gyroscope of the type which incorporates a plurality of electrodes arranged in a symmetrical array around a mass unbalanced conductive ball, which ball is adapted to be spun around a spin axis and wherein a plurality of circuits supply a plurality of signals to the plurality of electrodes to control the position of the spinning ball, a system comprising:

first means responsive to a plurality of electrode pickoff signals from the plurality of circuits for developing a plurality of first signals and a plurality of reconstructed MUM signals, each of the plurality of first signals containing a combination of MUM and servo signals; and

second means for respectively subtracting the plurality of reconstructed MUM signals from the plurality of first signals to develop a plurality of forcing signals having substantially no MUM components to control the operation of the plurality of circuits.

3,955,427

STARTER MOTORS

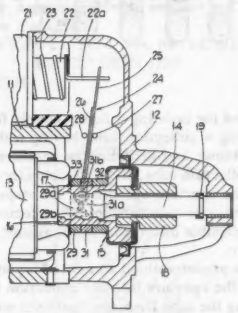
Christopher Peter Squires, Birmingham, England, assignor to The Lucas Electrical Company Limited, Birmingham, England

Filed Oct. 3, 1974, Ser. No. 511,778

Claims priority, application United Kingdom, Oct. 9, 1974, 47068/74

Int. Cl.² F02N *2/00*

U.S. Cl. 74—6 R **2 Claims**



1. A starter motor, for an internal combustion engine, including an electric motor, a shaft rotated by said motor,, a pinion gear-wheel assembly rotatable with said shaft, and movable axially on said shaft between an operative position and a rest position, an electro-magnet including an armature spaced from, and movable parallel to the said shaft and a lever assembly supported intermediate its ends for pivotal movement about an axis which lies at right angles to and which passes between, the axes of the shaft and the electromagnet, the lever assembly connecting the armature and the pinion assembly so that the pinion assembly can be moved between said rest and operative positions by said armature, resilient means urging the armature to a rest position, and said lever assembly including a first resilient element having one end engaging the armature, and its other end engaging the pinion assembly, said first resilient element being weaker than said resilient means, whereby in the event that the pinion gear-wheel assembly is held in its operative position, then when the electromagnet is de-energised the armature can be returned to its rest position, by said resilient means as permitted by flexure of said first resilient element, and said lever assembly further including a second resilient element, said second resilient element being so arranged with respect to said first resilient element that said second resilient element supports said first resilient element only during movement of the lever assembly to push the pinion gear-wheel assembly to its operative position, the combined strength of the first and second elements being insufficient to prevent movement of said armature under the action of the electro-magnet should the pinion gear-wheel assembly be held against movement to its operative

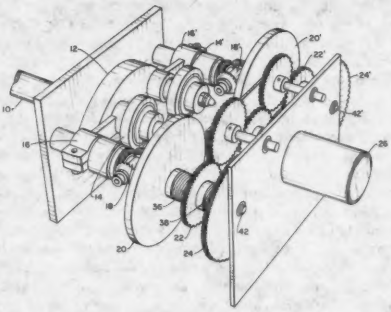
position, whereby the first and second lever elements will be flexed by the movement of the armature and will thus provide sufficient force to move the pinion gear-wheel assembly to its operative position when the impediment to movement of the pinion gear-wheel assembly is removed.

3,955,428

MECHANICAL AUTOMATIC TORQUE CONVERTER

Carter J. Ward, 244 Cedar St., Ventura, Calif. 93003

Filed Nov. 1, 1974, Ser. No. 520,070
Int. Cl.² F16H *33/02*
U.S. Cl. 74—64 **24 Claims**



1. A torque converter for transmitting power comprising:
a. means for applying input power to said torque converter;
b. means for generating oscillatory motion from said input power;
c. rectifying means coupled to said oscillatory motion generating means for rectifying the oscillatory motion coupled thereto;
d. output means;
e. means connected between said output means and said rectifying means for driving said output means such that said output means experiences unidirectional rotational motion; and
f. energy storage means coupled to said oscillatory motion generating means for storing such integrated amounts of said generated oscillatory power in the form of energy as is not transmitted to said rectifying means and dissipated at said output means, said generated oscillatory power absorption being divided in variable amounts between storage in the form of energy by said energy storage means and dissipation by said output means.

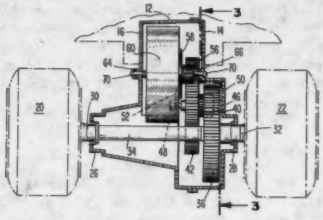
3,955,429

INERTIA MOTOR VEHICLE

John E. Holden, R.D. No. 1, Box 304, Mount Joy, Pa. 19552

Filed Feb. 14, 1974, Ser. No. 442,490
Int. Cl.² E16H *33/02*
U.S. Cl. 74—64 **6 Claims**

1. A toy vehicle of the flywheel propelled type comprising a vehicle body, an axle rotatably mounted in said body, motive power means to rotate said axle consisting of two manually rotatable, friction driven wheels rigidly mounted on said axle and extending beneath said body, a vertically extending drive gear having a vertical axis and mounted on said axle, a pinion gear engaging said drive gear, a vertically extending backgear having an horizontal axis, means rigidly and coaxially rotatably mounting said pinion gear and said backgear, a flywheel pinion gear having an horizontal axis and drivingly engaged by said backgear, a vertically extending flywheel parallel to said drive gear rigidly and coaxially mounted to said flywheel pinion, and means mounted to said vehicle rotatably supporting said flywheel and said flywheel pinion, the gear ratio between said drive gear and said flywheel pinion being at least about twenty to one, two of said vertically extending gears being substantially coplanar, whereby said toy is propelled by rotating said wheels by frictional, moving engagement of said



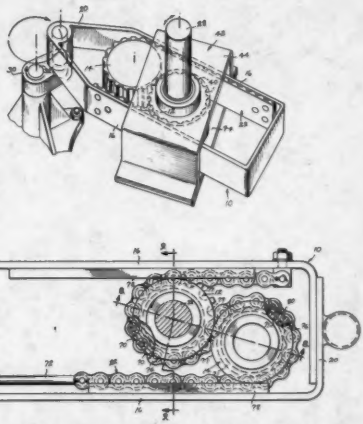
wheels with a surface and whereby release of said vehicle after initial rotation of said wheels allows said vehicle to be driven slowly by the release of energy stored in said flywheel.

3,955,430

DEVICE FOR PROVIDING RECIPROCATING ROTARY MOTION

Millard A. Rhoads, 1411 Lake Blvd., St. Joseph, Mich. 49085

Filed Apr. 8, 1974, Ser. No. 458,512
Int. Cl.² F16H *27/02*
U.S. Cl. 74—89.2 **4 Claims**



1. A device providing reciprocating rotary motion comprising frame means having spaced apart side walls extending between opposite frame means end parts, a flexible elongated tension member having two end portions and an intermediate portion, said tension member being secured to said frame means and having one of its end portions extending along one said side wall and the other of its end portions extending along the other side wall of the frame means, first and second rollers located within said frame means between said side walls and end parts, said rollers having parallel axes of rotation extending transversely to said tension member, the intermediate portion of said tension member extending about said rollers in an S-shaped configuration, one of said first and second rollers carrying power output means, means securing said one roller in a fixed operable location with said frame means being shiftable relative to said one roller, and means for moving one end part of said frame means relative to said one roller in fore and aft paths along the general direction of said side walls and within a plane of movement transverse to the axis of rotation

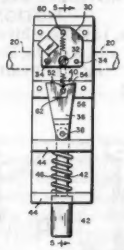
of said rollers whereby said one roller will experience reciprocating rotational movement about its axis of rotation, each roller being of a general spool-like configuration having spaced diametrically enlarged flanges adjacent the ends thereof, said rollers contacting one another at said flanges in all operative positions of said frame means, said tension member extending between said rollers within the spacing between said flanges, said flanges constituting spacing means for preventing said tension member from being compressed between said rollers.

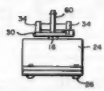
3,955,431

VALVE ACTUATOR MECHANISM

Alan C. Davis, Concord, and Domenic Di Persio, Lexington, both of Mass., assignors to Beatrice Foods Company, Chicago, Ill.

Filed Sept. 23, 1974, Ser. No. 508,402
Int. Cl.² F16H *21/54*
U.S. Cl. 74—100 R **2 Claims**





1. An actuator for opening and closing a rotary valve having a rotatable valve spindle, a rotor comprising a flat plate fixed to the spindle for rotation in a plane perpendicular to the axis of the spindle, first spaced pins fixed to the plate parallel to and at equal radial distances from the axis of the spindle on a line through said axis, a third pin fixed to the plate parallel to and at a greater radial distance from the axis of the spindle than the first pins and at equal distances from said first pins, a push rod reciprocally mounted for movement toward and from the axis of the spindle along a straight line intersecting the axis of the spindle and at the opposite side of said axis of the spindle from that of the third pin, a spring yieldably holding the push rod retracted with respect to the axis of the spindle, a rigid transfer arm pivotally connected at one end to the push rod with its distal end spaced from the axis of the spindle, and a spring connecting the distal end of the transfer arm to the third pin which operates to bias the transfer arm to that side of its distal end toward which the rotor is rotated with respect to its axis of rotation, said push rod operating each time it is pushed to effect rotation of the rotor to one side or the other of the axis of the spindle.

3,955,432

TRANSMISSION DEVICE

Yves Jean Kemper, Maisons-Laffitte, France, assignor to Vadetec S.A., Switzerland

Filed July 9, 1974, Ser. No. 486,859
Claims priority, application France, July 13, 1973, 73.25788
Int. Cl.² F16H *15/04*, *15/34*
U.S. Cl. 74—201 **16 Claims**

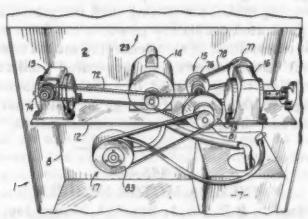
15. A power transmission comprising a first element comprising two axially spaced closed surfaces of revolution about a first axis defining two rolling surfaces on opposite sides of a plane normal to said first axis and passing through a point on said first axis, a second element driven conically about said point on the first axis and circumferentially of said first axis, said second element having two second rolling closed surfaces of revolution about a second axis and axially spaced on opposite sides of a plane passing through said point and normal to said second axis, said second axis intersecting said first axis at said point and being inclined to the first axis by an angle *a*, input torque means comprising a first shaft to impart conical movement to said second element conically about said point on the first axis and circumferentially of said first axis, said second element having means effective to develop gyroscopically when driven a gyroscopic torque effective for applying said rolling surfaces on each other for relative rolling thereon and contacting at two areas disposed on opposite sides of both axis and effective to couple said first and second element to prevent a sliding movement therebetween, means comprising a second shaft connected for taking out an output torque transmitted through said second element from said input torque means, and compensating means to compensate for the gyroscopic torque developed by said second element.

3,955,433

BASIC UNIT PROCESSOR FOR OFFSET PLATES AND METHOD OF PROCESSING THEM

John C. Hovekamp, Mansfield, Ohio, assignor to Buckler Industries, Inc., Mansfield, Ohio

Division of Ser. No. 386,510, Aug. 8, 1973. This application Dec. 11, 1974, Ser. No. 531,527
Int. Cl.² F16H *7/00*
U.S. Cl. 74—219 **4 Claims**



1. Apparatus comprising first and second drive roll means having spaced parallel axes and being paired for simultaneous engagement with material passing therebetween, and means to positively drive each said drive roll means in a direction opposite to the other; said last named means comprising a drive shaft means in spaced, parallel relation with said axes of said drive roll means, sprocket means mounted on said drive shaft means, sprocket means on each said drive roll means, first and second continuous flexible drive means engaging and driven by said drive shaft sprocket means, one said flexible drive means engaging said sprocket means on one said drive roll means and the other said flexible drive means engaging the said sprocket means on the other said drive roll means, said flexible drive means driving said first and second drive roll means in opposite directions, and means to rotate said drive shaft means.

3,955,434

POWER TRANSMISSION CHAIN LINK CONSTRUCTION

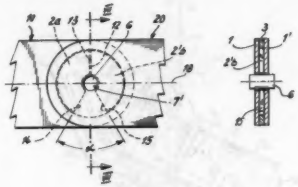
Kurt Henning, Georgensteinstr. 16, 8 Munich 71, Germany

Filed Nov. 20, 1974, Ser. No. 525,468

Claims priority, application Germany, Nov. 23, 1973, 2358451

Int. Cl.² F16G 13/06

U.S. Cl. 74—245 R 24 Claims



1. A power transmission chain link construction comprising a pair of side-by-side link plates; means pivotally connecting said plates for angular adjustment about an axis between two extreme positions; coplaner stop members carried by the respective plates adjacent said axis and extending radially thereof, said stop members having stop surfaces spaced from one another by a gap when said plates are in one of said extreme positions and engageable with one another when said plates are adjusted angularly about said axis to the other of said extreme positions; and guard means coplaner with said stop members and carried by one of said plates, said guard means extending circumferentially of said stop members and being of such angular length as to span said gap in all angularly adjusted positions of said plates.

3,955,435

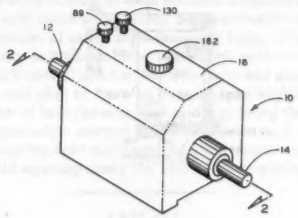
VARIABLE SPEED DRIVE MECHANISM

Robert E. Arick, 2613 Indiana Ave., Fort Wayne, Ind. 46807

Filed Oct. 18, 1974, Ser. No. 515,881

Int. Cl.² F16H 57/00, 3/44

U.S. Cl. 74—411 11 Claims



1. A speed control device comprising an input driving member, an output driven member, and a linkage therebetween including a first gear and an intermeshing second gear on said input and output members respectively, and means operatively controlling the ratio of rotatable and revolvable speed of said second gear relatively to said first gear during a combination of rotational and revolvable movement of said second gear, at least one set of three interconnecting gears one of which is fixed and is eccentrically mounted and including a hinged arm interconnecting said set gears whereby the rate of rotation and direction of the intermediate and outer gear of said set is determined by the degree of eccentricity of the fixed one of said gears from the center of rotation of said first gear, and means forming an operative connection between the said set of gears and the said first gear whereby the degree of eccentricity controls the speed of said output driven member, and means for operatively adjusting said eccentricity both during static and non-static conditions of said gears.

3,955,436

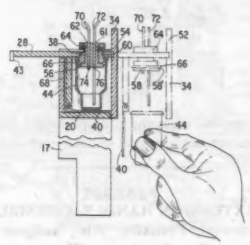
LIQUID SAMPLING AND CONTAINER HANDLING APPARATUS

Howard E. Tucker; James A. Corll, both of Los Alamos, N. Mex., and Walter R. Hogg, Miami Lakes, Fla., assignors to Particle Technology, Inc., Los Alamos, N. Mex.

Filed Mar. 10, 1975, Ser. No. 557,066

Int. Cl.² G01N 1/10

U.S. Cl. 73—421 R 26 Claims



1. Sampling apparatus for withdrawal of liquid samples from an open top sample container comprising:

means defining a compartment having at least one entrance, sampling head means mounted for communication into said compartment, said sampling head means including a first conduit communicating between a source of pressure and the interior of said compartment and a second conduit communicating between the interior of the sample container and a destination exterior of said compartment for receiving the withdrawn sample, means for selectively closing off said entrance when said container is within said compartment and means establishing a floating pressure seal upon introduction of positive pressure to said compartment when said entrance is closed off, further pressure introduction driving the liquid contents of the sample container through said second conduit to said destination, said means for establishing a floating pressure seal being disposed within the compartment and comprising first and second coaxial collar members arranged in facing relationship and a resilient sealing ring seated between said collar members, at least one of said collar members having a tapered surface facing the other of said collar members and means for moving one of said collar members toward the other upon introduction of pressure thereagainst to expand the sealing member against a surrounding surface whereby to define said seal.

3,955,437

TRANSMISSION CONTROL MECHANISM

Herman Heintz, Livonia, Mich., assignor to Massey-Ferguson Inc., Detroit, Mich.

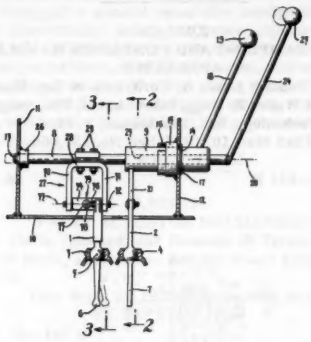
Filed Nov. 15, 1974, Ser. No. 524,018

Int. Cl.² G05G 9/12

U.S. Cl. 74—473 R 12 Claims

1. A control apparatus for transmissions and the like comprising a shift actuator lever universally pivotable about a fixed point, a movable control shaft having a longitudinal axis and a connection, said connection including a first element fixed to said shaft and a second element connected to said first element for translational movement with said first element and pivotal movement relative to said first element about an

axis parallel to said shaft axis, said lever being secured to said second element for universal pivotal movement about a fixed



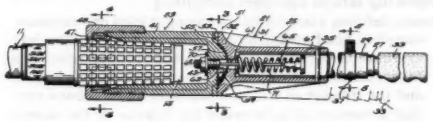
point on said second element in response to said translational and pivotal movements of said second element.

3,955,438

EXTENSION HANDLE ASSEMBLY

Robert Zakrzewski, Franklin, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Nov. 4, 1974, Ser. No. 520,433
Int. Cl.² G01M *1/168*
U.S. Cl. 74—480 B **9 Claims**



1. An auxiliary handle adapted to be removably attached to a rotatable part of an outboard motor steering handle for rotation of the steering handle part to control outboard motor engine operation and for lateral swinging movement of the steering handle to control outboard motor steering operation, said auxiliary handle comprising an attachment section adapted to be removably fixedly connected to the steering handle part for rotation of the steering handle part in response to rotation of said attachment section and for lateral movement of the steering handle in response to lateral movement of said attachment section, an extension section, and interengaging means on said extension section and on said attachment section for effecting common rotary movement of said attachment section in response to rotation of said extension section, and for effecting common lateral movement of said attachment section in response to lateral movement of said extension section, and for permitting movement of said extension section relative to said attachment section in response to application to said extension section of a force greater than the force resisting movement of said attachment section.

3,955,439

POSITIONING DEVICE FOR ADJUSTABLE STEERING COLUMN

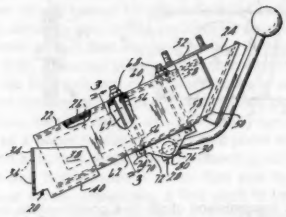
Lawrence L. Meyer, Northville, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Sept. 30, 1974, Ser. No. 510,514
Int. Cl.² B62D *1/18*
U.S. Cl. 74—493 **4 Claims**

1. In a positioning device for an adjustably mounted steering column of a motor vehicle, the positioning device including a stationary sleeve member inclined at a fixed acute angle to the axis of the steering column and a moveable sleeve member telescopically mounted relative to the stationary sleeve member and fixed to the steering column, the improvement comprising:

antifriction means disposed between said sleeve members for reducing sliding friction therebetween; and

means for locking said sleeve members in infinitely variable fixed axial relationship, said locking means comprising a cam member mounted on the stationary sleeve member



for rotation about an axis normal to the axis of said sleeve members between

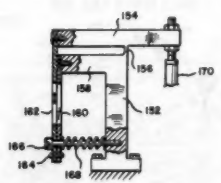
1. a first position in which said cam member operatively engages one of said sleeve members to apply a force in a direction normal to the axis of said sleeve members passing through said antifriction means thereby urging said sleeve members together, and
2. a second position in which said cam member is operatively disengaged from said one sleeve member.

3,955,440

MICRO-ADJUSTMENT APPARATUS

William H. Newell, Mount Vernon, N.Y., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Sept. 26, 1974, Ser. No. 509,585
Int. Cl.² F16C *1/10*; G02B *5/08*, *5/12*
U.S. Cl. 74—501 M **3 Claims**



1. Micro-adjustment apparatus for adjusting the relative position between two objects comprising:

a stem fixed to one of said objects;

an arm projecting from said stem;

a lever supported by a flexure joint on said stem to be in a position normally substantially parallel to said arm and connected to the other of said objects;

two flexure blades next to each other in parallel relation substantially transversely to said arm and to said lever, one end of one of the blades being connected to said lever and one end of the other of said blades being connected to said arm, and the other ends of said blades being joined together;

means for displacing said other ends of the blades in directions generally parallel to said lever and said arm whereby each of the flexure blades are curved a different amount so that the blades move longitudinally different amounts and cause the lever to pivot about said flexure joint.

3,955,441

PUSH-PULL CABLE MOUNTING ASSEMBLY

Donald L. Johnson, Kenosha, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Dec. 20, 1974, Ser. No. 534,902
Int. Cl.² F16C 1/10
U.S. Cl. 74—501 R 3 Claims

1. A push-pull cable mounting assembly, comprising a mounting member having a hole extending therethrough, an elongated push-pull cable including an elongated casing having spaced-apart shoulders and a reduced thickness portion between said shoulders and with said portion being snugly disposed in said hole, said shoulders being of an over-all dimension greater than that of said hole and spanning said hole, and said shoulders being disposed to be in opposed abutment with said mounting member to thereby restrict movement of said casing along the length of said casing, said mounting member having an opening contiguous with said hole for movement of said cable through said opening and into the aforesaid position of said cable in said hole in assembling said cable with said mounting member, and a plug separate from said cable being in the nature of a button having a shank portion disposed in said opening and having a head portion of a size larger than the spand of said opening for overlapping said opening and abutting said mounting member, and said plug being free of said cable to be movable separately from the position of said cable and thereby be positionable relative to and independent of said cable, said plug being of a resilient material, such as a plastic, and said shank portion including legs which are spaced apart in the free-body and unassembled position of said plug to have an over-all span slightly greater than the span of said opening, and said legs being flexible and thereby displaceable toward and away from each other for securely snapping into said opening upon movement of said plug into said opening along the axis of said opening.

3,955,442

TRANSFER CASE WITH GEAR AND CHAIN DRIVE

Leo R. Kessmar, Northwood, Ohio, assignor to Dana Corporation, Toledo, Ohio

Filed Feb. 28, 1975, Ser. No. 554,271
Int. Cl.² F16H 37/06
U.S. Cl. 74—665 GE 11 Claims

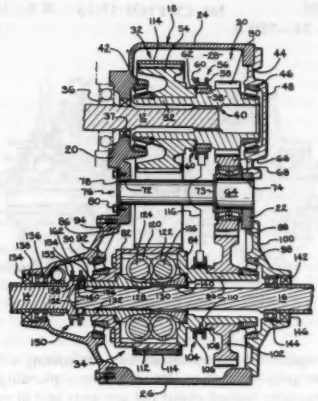
1. A torque transfer mechanism having a high and low speed power path comprising:

a. an input shaft;

b. an output shaft spaced from said input shaft;

c. a gear unit connecting said input and output shafts for establishing the low speed power path including a drive gear connected to said input shaft and driven gear drivingly connected to said drive gear and rotatably supported on said output shaft and having clutch means thereon;

d. a chain drive unit connecting said input and output shafts for establishing the high speed power path including a drive sprocket drivingly connected to said input shaft and a driven sprocket drivingly connected to said drive sprocket and rotatably supported on said output shaft and having clutch means thereon; and



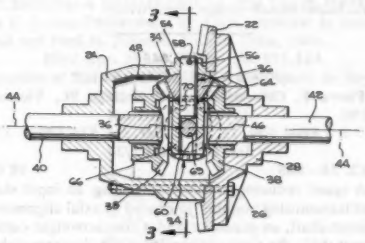
e. shiftable means carried on said output shaft being movable into selective engagement with said clutch means on said driven gear to connect said driven gear to said output shaft and into engagement with said clutch means on said driven sprocket to connect said driven sprocket to said output shaft.

3,955,443

DIFFERENTIAL GEAR MECHANISM WITH ASYMMETRIC PINION GEARS

Jose Luis Estrada, 14130 Orange St., Paramount, Calif. 90723

Filed Jan. 30, 1975, Ser. No. 545,572
Int. Cl.² F16H 1/40, 57/02
U.S. Cl. 74—713 20 Claims



1. In a differential gear assembly, the combination of an eccentrically weighted casing enclosing opposed bevel gears on a common axis and a differential gearing mechanism coupling said bevel gears, said mechanism comprising not less than three pinion gears asymmetrically arranged about said axis in counterbalancing relation with said casing, and shaft means supporting said pinion gears so disposed.

3,955,444

EPICYCLIC CHANGE-SPEED HUBS

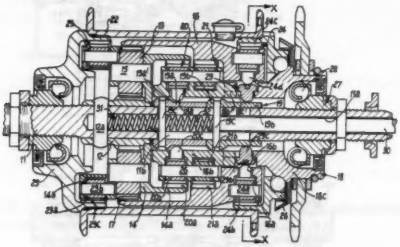
David Curtis Munn, Nottingham, England, assignor to Raleigh Industries Limited, Nottingham, England

Filed Mar. 18, 1974, Ser. No. 451,762

Claims priority, application United Kingdom, Mar. 23, 1973, 14250/73

Int. Cl. F16H 57/10

U.S. Cl. 74—750 B 15 Claims



1. An epicyclic change-speed hub comprising a hub axle, a fixed sun gear secured to the said axle, a plurality of planet gears angularly spaced about the sun gear and in mesh therewith, a planet cage supporting the planet gears and arranged coaxially with the axle, a gear ring having internal teeth in register with and engaged by the planet gears, a driver arranged in overlapping axial relationship with the planet cage and gear ring, a first unidirectional clutch means connecting the driver with the planet cage, a second unidirectional clutch means connecting the driver with the gear ring, a hub shell arranged coaxially with the axle and disposed radially outwardly of the planet cage and gear ring, third and fourth unidirectional clutch means respectively connecting the planet cage and gear ring with the hub shell, sleeve means slidably mounted for motion longitudinally of the axle and for selectively disengaging the first and fourth unidirectional clutch means as a function of the axial position thereof along the hub, and a displacement means arranged to effect adjustment of the sleeve means in the axial direction of the hub, said sleeve means comprising two separable sleeve members arranged in axially aligned disposition and slidably mounted on the axle, and resilient means resiliently loading the sleeve members outwardly of the hub and away from each other, the sleeve members being arranged to co-operate, according to their positions axially of the hub, with the first and fourth unidirectional clutch means respectively.

3,955,445

SPEED REDUCING DEVICE

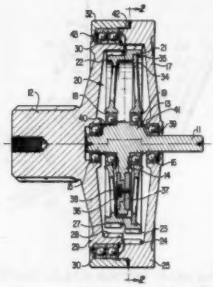
Jean-Pierre F. Osterwalder, 812 Cottage St., Vienna, Va. 22180

Filed Nov. 15, 1974, Ser. No. 524,230

Int. Cl.² F16H 1/28

U.S. Cl. 74—805 10 Claims

1. A speed reducing device, comprising: an input shaft; an output transmitting member journaled in axial alignment with said input shaft; an eccentric and a counterweight carried by the input shaft, the center of gravity of the counterweight lying on a line which extends from the input shaft diametrically opposite to a line from the input shaft to the center of gravity of the eccentric; a primary and a secondary gear mounted upon the eccentric for rotation together about said input shaft, said primary gear having a different number of teeth than said secondary gear, the primary and secondary gears being axially spaced along the input shaft to form a cavity and the counterweight being disposed within the cavity between said primary and secondary gears; a fixed gear spline in engagement with said primary gear, the primary gear having a smaller number of teeth than the fixed gear spline; said output transmitting member including a rotatable output gear spline in engagement with said secondary gear, the secondary gear having a smaller number of teeth than the output gear spline; a casing secured to said fixed gear spline; a bearing assembly mounted between said casing and said rotatable output gear spline in a direct straight line with the lines of force transferred by the gear teeth which are in mesh, said output gear spline being in direct engagement with said fixed gear spline through said casing and said bearing assembly, said casing and bearing assembly being located radially outwardly from said secondary gear to thereby achieve a short, compact, stiff torque path which extends from the fixed gear spline through the periphery of the primary and secondary gears to the output gear spline.



3,955,446

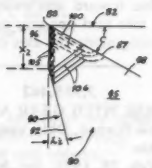
CUTTING TOOL FOR THE CONTINUOUS MACHINING OF METALS AND THE METHOD OF MAKING SAME

William L. Mundy, St. Louis, Mo., assignor to O'Fallon Investment Company, Maryland Heights, Mo.

Division of Ser. No. 304,771, Nov. 8, 1972, which is a continuation-in-part of Ser. No. 45,357, June 11, 1970, abandoned. This application June 24, 1974, Ser. No. 482,609

Int. Cl.² B26D 1/00; B21K 21/00

U.S. Cl. 76—101 A 5 Claims



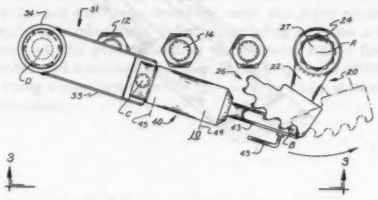
1. A method of making a cutting tool for machining a selected metal comprising the steps of forming the tool with a cutting edge made from a material that retains its cutting effectiveness at temperatures over about 1200° F., and with a side wear land surface and a side relief surface, the relief angle of the side land surface being substantially zero and the relief angle of the side relief surface being of a selected value, using the tool to machine the metal, and selectively changing the width of the side land surface and the magnitude of the side relief angle as needed such that the width of the side land surface becomes substantially constant as the tool is used to machine the metal.

3,955,447

PUSH-PULL POWER WRENCH FOR THREADED CONNECTORS

Kenneth Wade Parker, Houston, Tex., assignor to N-S-W Corporation, Houston, Tex.

Filed Sept. 17, 1974, Ser. No. 506,914
Int. Cl.² B25B 13/46
U.S. Cl. 81—57.39 11 Claims



1. An apparatus for wrenching one of a plurality of threaded connectors, comprising:

a wrench adapter for positioning over one of the connectors,

a wrench extending laterally from said wrench adapter,

elongate reaction means having a socket member at one end thereof positionable over another of said connectors, said reaction means having its longitudinal center axis extending directly from said socket member center to said wrench, and

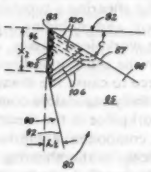
actuator means extending along said longitudinal axis of said reaction means and being operatively coupled to said wrench for rotating said wrench and said one connector.

3,955,448

CUTTING TOOL FOR THE CONTINUOUS MACHINING OF METALS AND THE METHOD OF MAKING SAME

William L. Mundy, St. Louis, Mo., assignor to O'Fallon Investment Company, Maryland Heights, Mo., a part interest

Division of Ser. No. 304,771, Nov. 8, 1972, which is a continuation-in-part of Ser. No. 45,357, June 11, 1970, abandoned. This application June 24, 1974, Ser. No. 482,607
Int. Cl.² B23B 3/00; B26D 1/00
U.S. Cl. 82—1 C 5 Claims



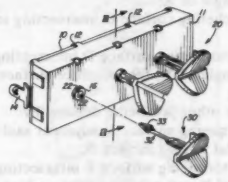
1. A method of machining a metal comprising the steps of selecting a cutting tool having a cutting edge made of a material that retains its cutting effectiveness at temperatures over about 1200° F., and having a side wear land surface and a side relief surface, the relief angle of the side land surface being substantially zero and the relief angle of the side relief surface being of a selected value, using the tool to machine the metal, selectively changing the width of the side land surface and the magnitude of the side relief angle as needed such that the width of the side land surface becomes substantially constant as the tool is used to machine the metal, and machining the metal with the cutting tool.

3,955,449

ADJUSTMENT TOOL FOR ROTATABLE INSTRUMENTALITIES

Richard J. Hofmeister, Arlington Heights, and Edward A. Salners, Mount Prospect, both of Ill., assignors to Quasar Electronics Corporation, Franklin Park, Ill.

Filed June 13, 1975, Ser. No. 586,878
Int. Cl.² B25B 23/16
U.S. Cl. 81—3 R 10 Claims



1. An adjustment tool for a rotatable instrumentality in a housing, such instrumentality having a hollow, rotatable hub of a predetermined length, with an end extending beyond the wall of the housing and having a drive slot in the extremity of such end, said tool including in combination:

a shaft having a first portion thereof with a diameter and length dimensions sufficient to pass through the hollow hub;

a resilient locking member at one end of said shaft, said locking member normally expanded to a size greater than the internal diameter of the hollow hub, and having cam surfaces thereon to permit insertion and removal of said shaft from said hub, said locking member being resiliently compressible to allow passage thereof through the hollow hub;

a drive slot engaging means at the other end of said shaft and extending radially outwardly therefrom for matingly engaging the drive slot in the end of the hub to limit the distance said shaft is insertable into the hub and to provide a driving connection between said shaft and the hub; and

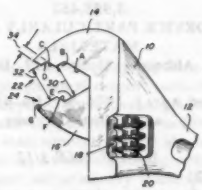
an enlarged head on said other end of said shaft for facilitating manual rotation thereof, said enlarged head having a screwdriver receiving slot therein and cam surfaces adjacent the screwdriver receiving slot for guiding screwdriver blades into engagement with the receiving slot.

3,955,450

ADJUSTABLE WRENCH FOR TORQUEING AND RATCHETING A SYMMETRICAL POLYGON MEMBER

James P. Evans, Oklahoma City, Okla., assignor to James R. Head and Paul H. Johnson, both of Tulsa, Okla.

Filed Apr. 25, 1975, Ser. No. 571,524
The portion of the term of this patent subsequent to Nov. 26, 1991, has been disclaimed.
Int. Cl.² B25B 13/16
U.S. Cl. 81—170 5 Claims



1. An adjustable wrench for torqueing and ratcheting a symmetrical convex polygon member, such as a square, hexa-

gon, octagon or the like, where the angle of intersecting sides is X, and the length along a side is Z, comprising:

a wrench body having a fixed jaw extending therefrom and a handle; and

a movable jaw movably supported to said wrench body opposite to said fixed jaw, the fixed jaw and movable jaw each having a member engaging face opposed to the other, one jaw face being defined by:

1. a first torqueing surface A adjacent said wrench body;
2. a second torqueing surface B intersecting said surface A at an angle of X;
3. a first ratcheting surface C intersecting said surface B; and
4. a second ratcheting surface D intersecting said surface C at an angle of X, the length of surface D being less than ½ Z;

the face of the other jaw being defined by:

1. a first torqueing surface E adjacent said wrench body and parallel to said surface B;
2. a second torqueing surface F intersecting surface E at an angle of X and being parallel surface A; and
3. a ratcheting surface G intersecting said surface F and being parallel surface D.

3,955,451

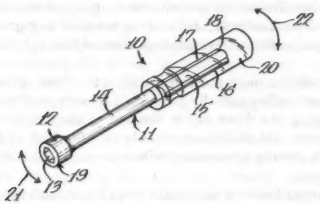
HAND-HELD SPIN-TYPE DRIVER TOOL

William F. Lohness, Jonesville, Mich., assignor to Vaco Products Company, Chicago, Ill.

Filed Feb. 14, 1975, Ser. No. 550,163

Int. Cl.² B25B *13/00*; B25G *3/12*

U.S. Cl. 81—177 R **7 Claims**



1. A hand-held spin-type driver tool, comprising: a shaft of uniform cross-sectional dimension having driver means at one end and a shank segment of reduced cross-section at the other end; a plurality of rigid fin-shaped members integral with said shank segment and extending outwardly therefrom beyond the diameter of the said shaft and running parallel to each other along the entire length of said shank segment; said shank being free of recesses; and a handle grip fitted around the shank segment; said fin-shaped members contiguously engaging the surrounding handle grip so as to prevent movement between said handle grip and said shaft in the presence of torsional forces.

3,955,452

CUTTING DEVICE PARTICULARLY FOR PLASTIC MATERIALS

Artur Fischer, Altheimer Strasse 219, D-7241 Tumlingen, Germany

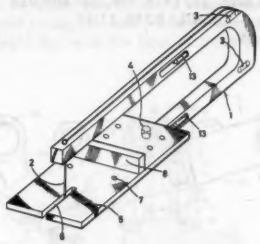
Filed Apr. 1, 1974, Ser. No. 456,991

Claims priority, application Germany, Mar. 31, 1973, 7312222[U]

Int. Cl.² B26F *3/12*

U.S. Cl. 83—171 **9 Claims**

1. A device for cutting plastic material, comprising a C-shaped support having two arms; an electric resistance wire extending from one of said arms to the other; a normally open switch mounted on said other arm at a distance from said wire and being adapted to energize said wire when actuated; a guide plate on said other arm supporting the plastic material to be cut, said plate being provided with a slot through which said wire extends; and means for rockably and removably mounting said plate on said other arm for pivotal movement



between a first and a second position about an axis extending transversely of the elongation of said arms intermediate said wire and said switch so that, when said plate is rocked to said second position, said switch is actuated and said wire is energized to cut the plastic material.

3,955,453

CUTTING OF METALS BY SHEARING

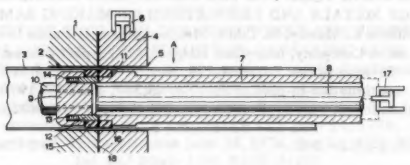
Richard Quentin Carmichael, Cambridge, and Roger George Bonelle, Burntwood, both of England, assignors to T.I. (Group Services) Limited, Birmingham, England

Filed June 13, 1974, Ser. No. 479,086

Claims priority, application United Kingdom, June 13, 1973, 28116/73

Int. Cl.² B23D *21/14*

U.S. Cl. 83—189 **7 Claims**



1. In apparatus for shearing a tubular workpiece in a plane transverse to its axis, and including a pair of apertured dies through which the workpiece passes, one of the dies being movable relative to the other in a direction transverse to the axis of the workpiece to cause the shearing action and a mandrel including a radially expansible component for supporting the inside of the workpiece in the shearing plane wherein said radially expansible component comprises at least one deformable elastomeric body in the shearing plane and means for compressing that body axially to cause it to expand radially and press against the inside of the workpiece so as effectively to form a shear blade within the workpiece which cooperates with the dies during shearing action.

3,955,454

EDGE PROXIMITY SENSOR FOR MOVING SHEET

Robert M. Copp, Brockton, Mass., assignor to Rubin Goldman, Newton Highlands, Mass.

Filed Oct. 3, 1974, Ser. No. 511,715

Int. Cl.² B26D *5/04*

U.S. Cl. 83—368 **7 Claims**

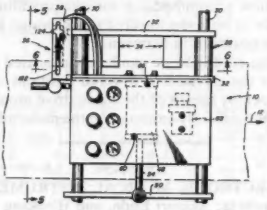
1. A device for locating a work performing device at a predetermined location with respect to an edge of a moving web comprising:

a carriage mounted for movement toward and away from the edge of the web and in a direction transverse to the direction of movement of the web;

means mounting the work performing device to the carriage for movement in unison therewith;

sensing means mounted to the carriage for sensing transverse movement of the edge of the web from a predetermined position;

drive means for effecting transverse movement of the carriage toward and away from the web, the drive means comprising a pneumatic cylinder including a piston and piston rod, the piston dividing the cylinder into a first chamber and a second chamber, the cylinder and piston rod being connected between the carriage and a stationary member;



means for maintaining the second chamber at a fixed, predetermined pressure;

means for applying air under pressure to the first chamber;

control means for varying the pressure in the first chamber in response to a change in position of the edge of the web from its predetermined position and including means for normally exhausting the first chamber at a predetermined flow rate and for varying the flow rate of the exhaust from said predetermined flow rate; and

the pressure applying means in communication with the first chamber of the cylinder being constructed and arranged to supply air at a predetermined pressure and at a flow rate equal to said normal exhaust flow rate whereby the cylinder may be actuated in a direction depending on the relative flow rates of the exhaust from and the pressure applying means to the first chamber.

3,955,455

RING CUTTING DEVICE

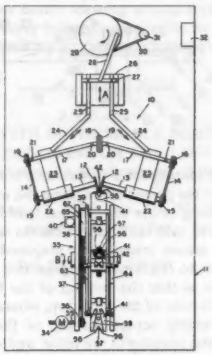
Jesus Guzman, 1028 El Camino Drive, Costa Mesa, Calif. 92636

Filed Dec. 10, 1973, Ser. No. 423,077

Int. Cl.² B26D *1/16, 5/06, 7/06*

U.S. Cl. 83—409.1 **10 Claims**

1. A ring cutting device comprising a spaced pair of rotatable cutting blades, means to rotate said cutting blades, said cutting blades each mounted on a moveable platform and moveable a selected equal distance, each said moveable platform including a hinged arm and means attached to said hinged arm adapted to spread and retract said arm to select angles for said cutting blades, a rotatable work holder, means to rotate said rotatable work holder, said rotatable work holder including at least one ring clamp, said at least one ring clamp hinged to said rotatable work holder including at least one ring clamp, said at least one ring clamp hinged to said rotatable work holder and having a first and second part, means to close said first and second ring clamp parts engaging a ring, and said rotatable work holder spaced to rotate said



ring in said ring clamp over a selected path by said cutting blades.

3,955,456

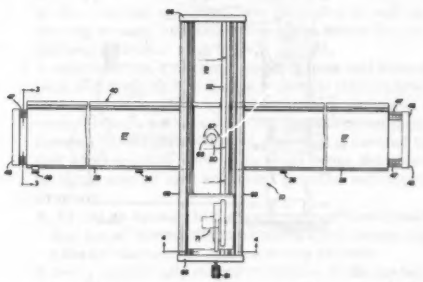
PORTABLE SAW TABLE

Eugene H. Van Cleave, Orchard Lake, Mich., assignor to Van Mark Products Company, Farmington Hills, Mich.

Filed Sept. 9, 1974, Ser. No. 504,044

Int. Cl.² B27B *5/20, 9/04*

U.S. Cl. 83—471.3 **20 Claims**

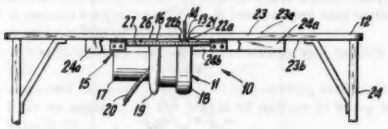


1. A saw table comprising an elongated main support member having spaced longitudinal support surfaces and a medially located boom support element, a saw-guiding boom pivotally mounted on said support element to extend generally transversely of said main support member at a selected cutting angle, said boom having a work supporting surface, and a pair of support extensions independently telescopically movable longitudinally of said main member along said support surfaces, each extension having an upper work supporting surface, said boom work supporting surface and said extension work supporting surfaces all being substantially co-planar for supporting an article to be cut by a saw guided along said boom at said selected cutting angle.

3,955,457
TABLE MOUNTING FOR POWER TOOL

Kenneth Mendelson, 1317 E. 8th St., Brooklyn, N.Y. 11230

Filed Mar. 25, 1974, Ser. No. 454,075
Int. Cl.² B27B 5/30
U.S. Cl. 83—477.2 13 Claims

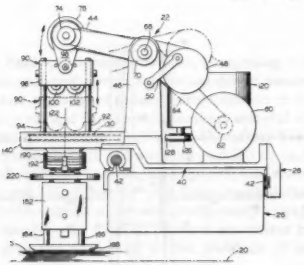


1. A table mounting for a power tool comprising means to hold the base of the power tool against the underside of a table having an opening in the top thereof, and means to join said holding means to said table, and wherein said holding means comprises rod means transversely disposed to the top of the base and means to frictionally engage said rod means to the top of the base so that the bottom of the base is frictionally held to the underside of the table top, wherein said rod means extends transversely across the top of the base and transversely across the opening in the table, and wherein the means to frictionally engage the rod means to the top of the base comprises means to hold the ends of the rod means in an upwardly biasing stress mode, whereby the power tool work member extends upwardly through the opening in the table and is held therein place.

3,955,458
CUTTING APPARATUS WITH SHARPENER AND SHARPENING METHOD

David Raymond Pearl, West Hartford, Conn., assignor to Gerber Garment Technology, Inc., East Hartford, Conn.

Filed Sept. 17, 1973, Ser. No. 398,255
Int. Cl.² B26D 1/04
U.S. Cl. 83—528 5 Claims



1. Apparatus for cutting sheet material held on a support surface of a cutting table in a spread condition comprising:

a mounting platform positioned above the support surface and movable relative to the table parallel to the support surface;

motor driven translating means connected with the mounting platform for moving the platform in a controlled manner parallel to the sheet material on the support surface;

a tool support mounted on the platform above the support surface of the table and movable relative to the platform toward and away from the support surface and sheet material thereon;

a reciprocating cutting blade suspended from the tool support and movable with the tool support from a lowered position in which the blade reciprocates along its own axis in cutting engagement with the sheet material on the table and an elevated position in which the blade reciprocates along its own axis out of engagement with the material;

a blade drive motor fixedly mounted on the mounting platform;

reciprocating drive means connected between the blade drive motor and the cutting blade for reciprocating the blade along its own axis in both the lowered and the elevated positions, said drive means also including a swivelling connection between the mounting platform and the cutting blade to permit the blade to be oriented about its own axis while reciprocating;

an orientation drive motor fixedly mounted on the mounting platform; and

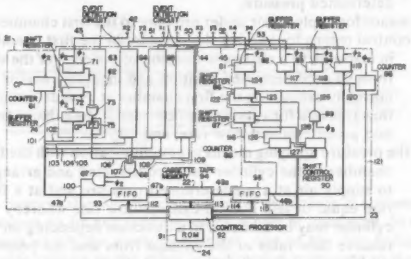
orientation drive means connected between the orientation drive motor and the reciprocating cutting blade for orienting the blade about its own axis and including a torque-transmitting sliding connection between the mounting platform and the cutting blade which sliding connection accommodates the reciprocating motion of the blade at both the lowered and elevated positions and at blade positions in between,

whereby the cutting blade can be reciprocated and oriented at either the elevated or lowered positions and positions in between by means of the blade drive motor and orientation motor fixedly mounted on the mounting platform.

3,955,459
ELECTRONIC MUSICAL INSTRUMENT

Yasunori Mochida; Akinori Endo, and Hirokazu Katoh, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed June 10, 1974, Ser. No. 477,996
Claims priority, application Japan, June 12, 1973, 48-65406; June 12, 1973, 48-65407; June 12, 1973, 48-65408
Int. Cl.² G10F 5/00; G10H 5/00
U.S. Cl. 84—1.01 4 Claims



1. In an electronic musical instrument of the type having a plurality of manually operable members including keys, control knobs, pedals and the like for controlling the musical instrument output; and means for developing digital signals representative of the settings of said manually operable members; an automatic system for developing, in a compressed format, the sequence of said digital signals developed during use of the electronic musical instrument comprising:

a. means receptive of and responsive to said digital signals for developing event signals corresponding to changes in the settings of ones of said plurality of manually operable members;

b. a counter for developing relative time digital signals representative of the time interval between successive ones of the event signals representative of changes in the setting of a corresponding one of said plurality of manually operable members; and

c. a first-in/first-out memory for sequentially storing said event signals and the corresponding relative time digital signals, and for reading-out the stored event signals and the stored corresponding relative time digital signals at

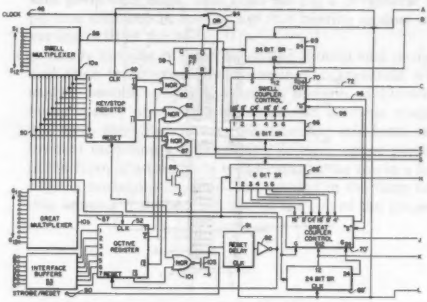
intervals less than the intervals represented by said event signals, thereby to develop a compressed sequence of signals representative of a sequence of settings of said manually operable members.

3,955,460

ELECTRONIC MUSICAL INSTRUMENT EMPLOYING DIGITAL MULTIPLEXED SIGNALS

James S. Southard, Union, Mich., assignor to C. G. Conn Ltd., Elkhart, Ind.

Filed Mar. 26, 1975, Ser. No. 561,970
Int. Cl.[2] G10H *1/02, 5/00*
U.S. Cl. 84—1.17 17 Claims



1. In an electronic musical instrument having at least first and second pluralities of key switches for each of first and second keyboards, respectively, including in combination:

first means for simultaneously scanning said key switches in said first and second pluralities thereof sequentially and repetitively to detect actuation of any one or more key switches in each of said pluralities;

second means coupled with the output of said first means for generating a first digital signal comprised of a sequence of pulses representative of respective actuated key switches in both of said first and second pluralities of key switches, the time length of said first digital signal being at least equal to the product of the number of key switches for one of said keyboards and the time required to scan one key switch; and

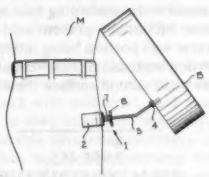
third means coupled with said second means for supplying sound signals to a load, said sound signals being determined by the time positions of said pulses in said digital signal.

3,955,461

MUSICAL INSTRUMENT STABILIZER

Clarence L. Ivie, P.O. Box 226, Liberty, Tex. 77575

Filed Mar. 17, 1975, Ser. No. 559,143
Int. Cl.[2] G10G *5/00*
U.S. Cl. 84—327 10 Claims



1. Apparatus for stabilizing a stringed musical instrument, while held by a musician, of the type having a body and fretted neck, said apparatus comprising:

a support member for resting against the trunk of said musician's body;

a rod member attached at one end to said support member and projecting generally away from said musician's body trunk; and

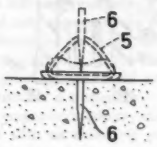
a mounting member attached to the back of the body of said instrument and engageable by the other end of said rod member to generally support said instrument in an oblique plane for better viewing of said fretted neck, said mounting member being disengageable by said other end of said rod member to facilitate storage of said instrument.

3,955,462

FASTENER WITH DEFORMABLE PORTION FOR GUIDING PINS OR THE LIKE

Oswald Willy Thorsman, 31 Stenbrovagen, Nykoping, Sweden (61100)

Filed Apr. 17, 1973, Ser. No. 351,900
Claims priority, application Sweden, Apr. 21, 1972, 5254/72
Int. Cl.[2] F16B *19/14*
U.S. Cl. 85—10 R 14 Claims



1. A fastener combination characterized by:

a. at least one anchoring element which is adapted to be driven into a base,

b. a guide member for each said anchoring element which includes

1. a substantially planar bottom plate that is adapted to rest against the base into which the anchoring element is to be driven, said bottom plate being adapted to serve as a support for the tip of said anchoring element prior to the time that a driving force is applied to said anchoring element and as a lower guide means for said anchoring element after force is applied,

2. a superstructure extending upwardly from said bottom plate and bridging over it so as to form at least a partial roof over an area of said planar bottom plate and a cavity between such roof and the planar bottom plate, the area of said planar bottom plate that is covered by said superstructure roof being many times the cross-sectional area of said anchoring element, said superstructure:

A. having an opening in the uppermost portion thereof that has an internal diameter which approximates the external diameter of said anchoring element,

B. being symetrically shaped in relation to the anchoring element,

C. having its lower portion joined to said substantially planar bottom plate around a junction line that defines an area many times greater than the area of said opening in the uppermost portion of the superstructure and

D. having its uppermost portion that contains said hole spaced away from said planar bottom plate by a distance which is equal to a substantial portion of the length of the anchoring element,

c. said anchoring element being in tight fit engagement with the hole in said superstructure portion and having its axis directed substantially perpendicular to the plane of said bottom plate and having a cross section substantially less than the largest cross section of said cavity in a plane

perpendicular to said anchoring element, whereby during the course of driving said anchoring element into a base, said superstructure and said bottom plate will continue to guide said anchoring element until such time as the driving force has flattened said superstructure against said bottom plate and eliminated the cavity therebetween,

d. said cavity between the bottom plate and the superstructure having a continuously decreasing cross section from the bottom plate up to the level for the engagement of the anchoring element in the superstructure.

3,955,463

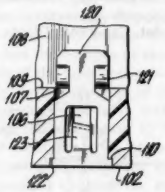
SCREW MOUNTING MEANS

Rudolph H. Hoehn, Queens, N.Y., assignor to Slater Electric Inc., Glen Cove, N.Y.

Continuation-in-part of Ser. No. 170,052, Aug. 9, 1971, abandoned. This application July 30, 1973, Ser. No. 384,012

Int. Cl.² F16B *17/00, 37/02*

U.S. Cl. 85—36 **7 Claims**



1. Threaded screw mounting means comprising:

a screw mounting member;

a screw-receiving unthreaded borehole formed in said mounting member;

a first axially extending slot formed in the wall of said borehole;

a second slot formed in said mounting member adjacent said borehole and extending generally parallel thereto, said second slot including an enlarged width portion extending to the top of said borehole and forming a pair of laterally opposed seats in said second slot,

said first slot communicating said borehole with said second slot;

a generally flat clip member slidably lockably received in said second slot, said clip member including

a yieldable pawl arm struck from said clip member at one end thereof and extending angularly through said first slot into said borehole and inwardly thereof,

a pair of laterally opposed ears formed on said clip member received by said seats when said clip member is lockably received in said second slot,

yieldable detent means struck from said clip member at the end thereof opposite said yieldable pawl arm, said detent means extending outwardly from the side of said clip member opposite that from which said yieldable pawl arm extends and angularly in a direction opposite to the direction of movement of said clip member so as to be deflected as said clip member is slidably inserted into said second slot, said yieldable detent means further extending beyond the bottom end of said second slot and bearing against the backside of said screw mounting member when said ears are located in said seats; whereby said clip member is locked in said second slot when said ears are received in said seats and said yieldable detent means bears against the backside of said screw mounting member, and said pawl arm yields to inward axial movement of a threaded screw into said borehole but wedges against the screw threads to prevent outward axial movement of the screw.

3,955,464

EXPANSIBLE ANCHOR FOR SECURING AN OBJECT TO A SUPPORT STRUCTURE

Artur Fischer, Altheimer Strasse 219, D-7241 Tumlingen, Germany

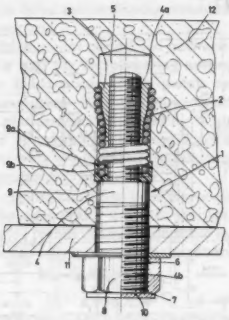
Filed Apr. 11, 1974, Ser. No. 460,067

Claims priority, application Germany, May 25, 1973, 2326713

The portion of the term of this patent subsequent to Sept. 24, 1991, has been disclaimed.

Int. Cl.² F16B *13/06*

U.S. Cl. 85—64 **6 Claims**



1. An expansible anchor for securing an object to a support structure comprising an expansion sleeve having a leading end portion and a trailing end portion and adapted for insertion in an anchoring hole of a support structure; an expander member at said leading end portion; an expander screw in form of a threaded rod-like member extending through said sleeve and having a front portion engaging said expander member for drawing the same into said sleeve to thereby expand the latter, a rear portion which extends outwardly from said trailing end portion and is adapted to extend through an object to be secured to the support structure, and an abutment portion forming an annular shoulder extending radially outwardly of said front portion and having an outer diameter equal to the outer diameter of said sleeve; a nut threaded onto said rear portion of said screw and arranged to engage said rear portion of said screw and cause the latter to turn in response to turning of said nut which results in drawing of said expander member into said sleeve; and a cap having concentric inner and outer annular wall portions and a transverse wall portion connecting said annular wall portions, said wall portions having respective first surfaces bounding a space for receiving said trailing end portion of said sleeve, and second surfaces opposite said first surfaces, the second surface of said outer annular portion having a diameter exceeding that of the anchoring hole of the support structure prior to cap insertion whereby said cap is frictionally retained in the anchoring hole against rotation and said first surfaces frictionally prevent said sleeve from rotating, said transverse wall portion being interposed between said trailing end portion and said annular shoulder of said expander screw so that said second surface thereof abuts said annular shoulder.

3,955,465

DRUM CONSTRUCTION

William T. Zickos, 10212 W. 96th Terrace, Overland Park, Kans. 66212

Filed Oct. 2, 1974, Ser. No. 511,217

Int. Cl.² G10D *13/02*

U.S. Cl. 84—411 R **4 Claims**

1. A drum comprising:

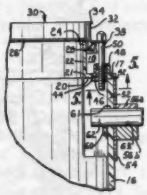
a hollow drum body, said body including a shell of substantially bowl-shaped configuration, said shell presenting a circular upper periphery;

said body including an annular shoulder extending inwardly from said upper periphery and terminating inwardly in a circular edge;

said body further including a substantially vertical wall extending upwardly from said circular edge and terminating upwardly in a peripheral edge, said peripheral edge being of circular configuration and defining a top end of said body, said shoulder and wall cooperating to define an annular recess in said body below said top end thereof;

a flexible drum head covering said top end and engaging said peripheral edge, said head having a peripheral rib portion disposed in said recess and bearing against said vertical wall of the body;

a generally circular bracket extending around said peripheral edge in substantially continuous engagement with said rib portion to bear downwardly thereon, said bracket being spaced above said shoulder and movable toward and away therefrom to vary the tension in said head, said bracket including a substantially vertical, upper portion in the form of a thin plate terminating at the top in a free edge, a horizontal intermediate portion in the form of a thin annular plate bearing against the top of the rib portion of said drum head, and a generally vertical skirt in the form of a thin plate extending around said rib portion in substantially continuous contact therewith to substantially cover the latter;



a plurality of individual lugs each comprising a thin plate integral with said bracket and extending outwardly from the upper edge of said skirt, said lugs presenting separate generally horizontal tensioning surfaces located on a plane overlying said rib portion, said lugs being spaced above said shoulder at locations within said recess and spaced from one another around the circumference of said bracket; and

a pair of gussets for each lug, said gussets extending generally downwardly from the lateral edges of said lugs to integrally connect with said skirt, said gussets being tapered in shape as they extend downwardly; and

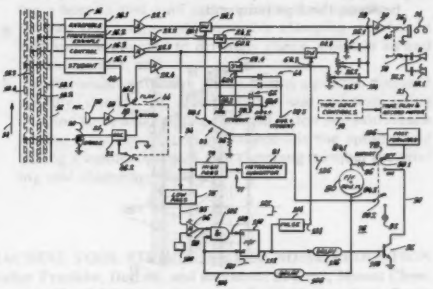
a plurality of adjustable tensioning members, one tensioning member for each lug, said tensioning members being engageable with the respective tensioning surfaces and extending within said recess from the respective lugs to said shoulder to maintain the spacing therebetween, said tensioning members being selectively and individually adjustable to exert forces on said bracket through said lugs to effect movement of said bracket toward and away from said shoulder, thereby varying the tension of said head.

3,955,466

PERFORMANCE LEARNING SYSTEM

Peter C. Goldmark, Stamford, Conn., assignor to Goldmark Communications Corporation, Stamford, Conn.

Filed July 2, 1974, Ser. No. 485,220
Int. Cl.² G09B *15/00*
U.S. Cl. 84—470 **18 Claims**



1. A performance learning system for a program comprising

a readable record carrying notations pertaining to a predetermined uninterrupted performance for the program, the readable record carrying visual stop notations spaced along the program at locations selected to designate learning segments for a student;

a multiple track magnetic medium, said magnetic medium being provided with an ensemble prerecorded track on which is recorded, in a playback/record directional movement of the magnetic medium, a continuous uninterrupted recording of the program with said predetermined performance omitted from the recorded ensemble, a student track to record, in the playback/record direction, a student's rendering of the omitted performance, said magnetic medium being provided with prerecorded control signals located on the magnetic medium in corresponding spaced relationship with the ensemble recording as the visual stop notations are located on the readable record relative to the performance thereon;

means for playing back recordings from the magnetic medium tracks and producing playback signals and control signals representative of the recordings on the magnetic medium;

means operative during playback/record movement of the magnetic medium for recording a student's rendition of the omitted performance on the student track in synchronous relationship with the playback of the uninterrupted ensemble recording;

repeat means for causing rapid backtrack motion of the magnetic medium;

switch means for interrupting backtrack movement of the magnetic medium; and

backtrack control means coupled to the stop control signals for enabling actuation of the switch means during backtrack movement of the magnetic medium to terminate its motion at a desired stop control signal;

whereby a student may backtrack to a previous stop control signal at a visually identifiable location on the readable record for a repeat of a student rendition of the omitted performance.

3,955,467

UNI-DIRECTIONAL ROPE

Edwin W. Johnson, Jr., 2551 Green Castle Court, Oxnard, Calif. 93030

Filed Nov. 25, 1974, Ser. No. 526,902
Int. Cl.² D04C *1/12*
U.S. Cl. 87—7 **1 Claim**

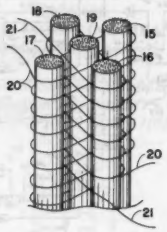
1. A uni-directional rope comprising, in combination:

a. four warps running parallel to each other and positioned such that when viewed in cross section, their centers fall

on the corners of a square to define first and second diagonally opposite pairs;

b. a fifth warp passing centrally of the four warps in parallel relationship such that its center coincides with the geometric center of said square;

c. a first bobbin thread passing directly about the first diagonally opposite pair without crossing between said pair so that opposite side portions of said fifth warp are held between the first pair; and,



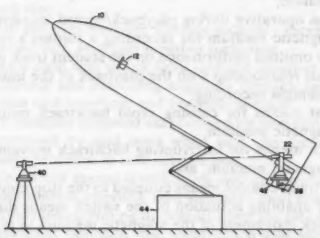
d. a second bobbin thread passing directly about the second diagonally opposite pair without crossing between said second pair so that opposite side portions of said fifth warp circumferentially spaced 90° from said first mentioned opposite side portions are held between the second pair so that the outer four warps are bound to said fifth warp without any portion of the first bobbin thread crossing itself and without any portion of the second bobbin thread crossing itself, the parallel warps resulting in minimum elongation of said rope when under tension.

3,955,468

SIGHTING AND LAYING SYSTEM FOR A MISSILE LAUNCHER

Fredrick J. Romilly, Warren, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 6, 1974, Ser. No. 495,153
Int. Cl.² F41G *3/02*
U.S. Cl. 89—1.8 **1 Claim**



1. A process for sighting and laying a missile and its gyro axis to a predetermined elevation and orient this axis in any desired horizontal direction, comprising:

establishing a cant axis reference in a rear sight mounting assembly about which a theodolite can be aligned to compensate for a non level attitude launcher elevating and orienting mechanism,

autocollimating said theodolite on said cant axis to establish the theodolite axis parallel therewith,

locking said theodolite in said parallel position,

establishing a missile gyro reference on the forward end of said missile, optically transferring said gyro axis to the exterior of said missile,

autocollimating said theodolite axis on said gyro axis reference using azimuth and elevation adjustments,

setting the azimuth scale of said theodolite to read 0°,

rotating said theodolite mounting assembly against selected elevation stops,

establishing an elevation reference in said theodolite mounting assembly,

elevating said missile to match said elevation references to thus align said missile gyro axis to the selected elevation, and

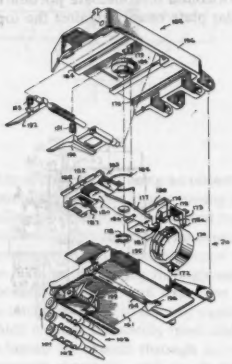
laying the missile in a selected azimuth.

3,955,469

FEED TRANSFER MECHANISM

James F. Conley, Kennebunk, Maine, assignor to Maremont Corporation, Saco, Maine

Division of Ser. No. 507,997, Sept. 20, 1974. This application Sept. 16, 1975, Ser. No. 614,022
Int. Cl.² F41D *9/02*
U.S. Cl. 89—33 BB **7 Claims**



1. A feed transfer mechanism for an automatic firearm having a receiver housing with a transverse feedway to receive a linked belt of rounds of ammunition, a barrel assembled with the receiver housing, and a bolt supported for reciprocative movement in the receiver housing in coaxial alignment with the barrel and transported by a bolt carrier, the feed transfer mechanism comprising a pawl means supported by the receiver housing for engaging a round of ammunition, an actuator supported by the receiver housing and engagable with the pawl means for moving the pawl means transversely of the center line of the barrel and thereby moving a round of ammunition along the feedway to a position for engagement with the bolt, actuator drive means rotatable about the center line of the barrel for driving the actuator, and feed drive means on the bolt carrier for rotating the actuator drive means.

3,955,470

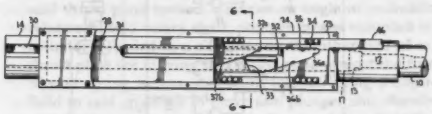
BOLT OPERATING AND LOCKING MECHANISM FOR CLOSED BREECH ROCKET GUN

George R. Kruzell, 301 Hotchkiss, Bay City, Mich. 48706

Continuation-in-part of Ser. No. 397,198, Sept. 13, 1973, abandoned. This application Apr. 24, 1975, Ser. No. 571,296
Int. Cl.² F41D *3/06*
U.S. Cl. 89—185 **16 Claims**

1. In a closed breech automatic firing gun including a barrel having a bore extending therethrough and communicating at its rearward end with a receiver through a breech opening, said barrel defining a sealing surface around said breech open-

ing, a bolt guided for projection and retraction movement in said receiver respectively toward and away from said breech opening and formed with a sealing surface for flush sealing engagement with said breech opening sealing surface in the forwardly projected position of said bolt, an outwardly extending lug connected to said bolt, a bolt operating and locking mechanism including a guide plate mounted on said receiver, a bolt operating plate having an opening therein and being slidably guided along said guide plate for movement parallel to said bolt movement into contacting engagement with said lug through said opening for moving said bolt between its projected and retracted positions, said guide plate having upstanding walls located along opposite sides thereof and



spaced slightly outwardly of opposite sides of said bolt operating plate, anti-friction ball bearings located between said upstanding walls and said respective sides of said bolt operating plate to facilitate a smooth sliding movement of said bolt operating plate during automatic firing, an angled abutment wall on said receiver with which said lug engages for locking said bolt when in its forwardly projected position, a gas cylinder and piston unit communicating with said barrel for the reception of pressurized gas therefrom for actuating said unit with said bolt operating plate to retract it for unlocking said bolt and moving said lug away from said abutment wall incident to the firing of a round of ammunition through said barrel.

3,955,471

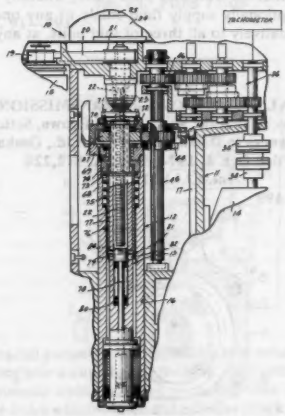
MACHINE TOOL SPINDLE

James L. Frazier, Los Alamitos, Calif., assignor to Houdaille Industries, Inc., Buffalo, N.Y.

Division of Ser. No. 238,434, March 27, 1972, Pat. No. 3,893,371. This application Oct. 9, 1974, Ser. No. 513,318

Int. Cl.² B23Q *1/08*

U.S. Cl. 90—11 D **7 Claims**



1. A machine tool comprising in combination:

a. a head;

b. a tubular quill non-rotatably axially-slidably mounted on said head;

c. an electric quill motor having a driving connection with said quill for axially reciprocating said quill;

d. a tubular spindle rotatably mounted by and within said quill and supported by said quill against relative axial movement with respect to the quill, but axially movable therewith during machining;

e. a spindle motor drivably connected to rotate said spindle with respect to said quill;

f. an annular fluid-pressure-actuated piston sealingly engaging a bore in said quill and encircling said spindle;

g. at least one reciprocably movable clamping member in said spindle adapted to drivingly clamp a tool in an end of said spindle; and

h. a reciprocable actuating means having a portion disposed radially outside of said spindle, said portion being adapted to be axially driven by said piston and said means having a further portion radially inside the spindle and having a connection with said clamping member for driving said clamping member.

3,955,472

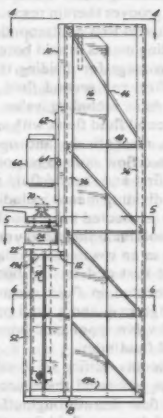
MACHINE TOOL STRUCTURE FOR NOISE REDUCTION

Walter Frankiw, Detroit, and Raymond S. Kusz, Mount Clemens, both of Mich., assignors to Lear Siegler, Inc., Santa Monica, Calif.

Filed July 22, 1974, Ser. No. 490,358

Int. Cl.² B23D *41/06*

U.S. Cl. 90—86 **15 Claims**

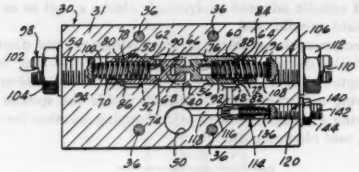


1. A machine tool characterized in minimal noise production during operation, said tool having a generally rectangular, heavy, solid, unitary, metal, slab-like main support plate, rib means integrally secured to one side of said plate and extending from one transverse edge at least substantially to the opposite edge of said plate and spaced inwardly from the remaining longitudinal edges of said plate, a first machine component rigidly secured to one side of said plate, an open truss-like frame structure connected to said plate, and said frame structure including means extending to the bottom of said plate to provide support for said plate directly from a supporting floor, and a second machine tool component in operative juxtaposition to said first component.

3,955,473
POWER STEERING GEAR WITH PROPORTIONAL FLOW DIVIDER

Gerald K. Oxley, and Harold K. Clendenen, both of Lafayette, Ind., assignors to TRW Inc., Cleveland, Ohio

Filed Oct. 5, 1973, Ser. No. 404,129
Int. Cl.² F15B 13/06
U.S. Cl. 91—412 5 Claims



1. A fluid system comprising:

a housing including an inlet fluid passage for connection to a source of presssurized hydraulic fluid, a first outlet fluid passage for connection to a first hydraulic circuit, and a second outlet fluid passage for connection to a second hydraulic fluid circuit;

a bore including a bore wall in said housing in fluid communication with said inlet passage and said first and second outlet passages;

said bore wall including first and second axially spaced circumferential grooves therein respectively in fluid communication with said first and second outlet passages,

proportional dividing means in said bore in communication with said inlet passage for dividing the fluid received at said inlet into first and second fluid flow portions at a predetermined ratio including valve means connecting said first and second fluid flows with said first and second outlet passages, respectively, and operable to maintain the predetermined flow ratio in response to flow demand changes of the first and second fluid circuits;

said proportional dividing means including first and second axially movable connected valve spools in said bore, each of said valve spools including a circumferential groove for communicating in an overlapping relation with a respective one of said first and second bore wall grooves, an axial bore connected in fluid communication with its circumferential groove, and a fluid proportioning orifice connecting said valve spool axial bore in fluid communication with said fluid inlet,

the fluid proportioning orifice of a valve spool having a pressure change generated thereacross in response to a change in fluid flow therethrough effective to move said valve spools and decrease fluid flow through the overlapping set of grooves which is passing a flow greater than its predetermined portion in response to a flow demand change by one of said hydraulic circuits,

one of said valve spools includes a transversely extending T-shaped slot at one end thereof, and

the other of said valve spools includes an axially projecting and transversely extending T-shaped projection at one end thereof to be received in said T-shaped slot for connecting said valve spools and for enabling said valve members to move anxially relative to each other;

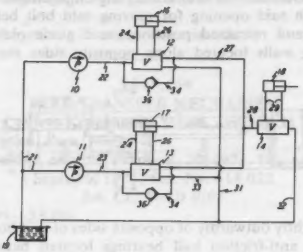
a steering gear mounted in said housing including a rotatably mounted input shaft, a rotatably mounted output shaft rotatable in response to rotation of said input shaft, a fluid inlet passage and a fluid outlet passage defining said first fluid circuit; and

a fluid outlet connected in communication with said first fluid circuit for returning fluid to the source.

3,955,474
FLUID PRESSURE SYSTEM HAVING PUMPS AND VALVES

Donnell L. Dunn, Terre Haute, Ind., assignor to J. I. Case Company, Racine, Wis.

Filed Mar. 19, 1975, Ser. No. 559,746
Int. Cl.² F15B 13/06, 13/09
U.S. Cl. 91—414 5 Claims

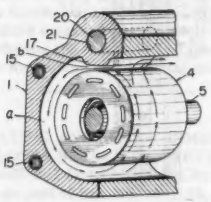


1. In a fluid pressure system having two fluid pumps, a plurality of valves fluid-flow connected with said pumps, and a plurality of fluid-pressure responsive units fluid-flow connected with said valves for operation in response to the settings of said valves, the improvement comprising two of said valves being respectively fluid-flow connected with said pumps, two of said units being respectively fluid-flow connected with said two valves for operation of each of said units through fluid pressure created by a respective one of said pumps, a fluid-flow connection extending between said two valves for fluid-flow interconnecting said two valves, at least one of said two valves including a fluid-flow control member having a fluid passageway for directing the flow of fluid to said fluid-flow connection for applying the fluid flow from said one valve to the other of said valves, whereby the output of both said pumps is applied to said other valve, a third one of said valves fluid-flow connected with said fluid-flow connection for receiving fluid flowing through the first mentioned said two valves, and a third one of said fluid-pressure responsive units fluid-flow connected with said third valve, whereby said two pumps can optionally supply fluid solely to any one of said units or alternatively to all three of said units, at any time.

3,955,475
AXIAL PISTON POWER TRANSMISSION

Takeshi Horiuchi, Ibaraki, and Kazuaki Ogawa, Settu, both of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Oct. 4, 1974, Ser. No. 512,220
Int. Cl.² F01B 13/04
U.S. Cl. 91—499 3 Claims



1. An axial piston power transmission comprising:

a. a housing having a stationary valve plate,

b. a rotary shaft supported internally in said housing and extending transversely thereof through said housing,

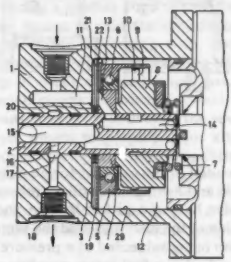
c. said housing having a drain outlet spaced vertically above said rotary shaft,
d. a cylinder barrel supported with said rotary shaft to be rotatable relative to said valve plate, said cylinder barrel having a plurality of holes extending in an axial direction thereof,
e. a plurality of pistons mounted for reciprocation within said holes respectively,
f. a thrust plate mounted inside said housing and connected to each said piston, said thrust plate being adjustable so as to be disposable at an angle relative to the axis of said rotary shaft,
g. an adjusting means for said thrust plate including spring means disposed on one side of said thrust plate for urging said thrust plate toward a maximum angle of inclination relative to said rotary shaft, plunger means mounted in a cylinder disposed in a chamber on the other side of said thrust plate for moving said thrust plate against the force of said spring means, a conduit for delivering a control fluid to said chamber to move said plunger and, thereby, said thrust plate, control means for regulating fluid flow through said conduit, said chamber being disposed to extend axially relative to said housing and protruding radially inwardly toward said cylinder barrel, said cylinder chamber having an exterior axial length substantially equal to that of said cylinder barrel so that the space between said cylinder barrel and said exterior of said cylinder chamber defines a restricted flow path for fluid in said housing whereby, when said cylinder barrel is rotating, fluid flowing through said restricted flow path will attain a maximum velocity flow,
h. said cylinder chamber having an outlet passage opening to said restricted flow path between said cylinder chamber and said cylinder barrel so that fluid from said outlet passage will be forceably circulated around said cylinder barrel and thereafter discharged externally of said housing through said drain outlet in said housing.

3,955,476

RADIAL PISTON-TYPE PUMP

Anton David, Gotzenhain, and Peter Treusch, Mainz, both of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Aug. 1, 1974, Ser. No. 493,498
Claims priority, application Germany, Aug. 14, 1973, 2341013
Int. Cl.² F01B *13/06*
U.S. Cl. 91—491 **5 Claims**



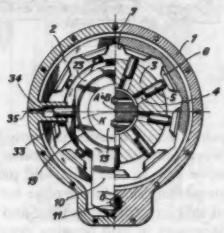
1. A radial piston-type pump with a non-rotating control pin projecting into a cup-shaped housing, the control pin supporting a pivoted cylinder block including one or more radial cylinder holes which - when the cylinder block is rotating - are alternately connected with a suction line and a pressure line, means guiding pistons having end surfaces which project to the outside to rest against a stroke ring eccentrically arranged relative to the control pin, a connecting channel leading from the radial outer area of the inside chamber of the housing to the suction line of the pump, said connecting channel being defined by the interspace between the bottom of the housing and a wall disposed a distance off the bottom of the housing, the wall including openings in a radially directed outer area, and the wall being designed as a disc arranged on the control pin.

3,955,477

HYDROSTATIC PISTON MACHINE HAVING A GUIDE FOR LATERALLY GUIDING A CYLINDER BLOCK PINTLE

Peter Rutz, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Nov. 14, 1974, Ser. No. 523,984
Claims priority, application Switzerland, Nov. 27, 1973, 16626/73
Int. Cl.² F01B *13/06*
U.S. Cl. 91—497 **9 Claims**



1. A hydrostatic piston machine comprising
a casing;
a cylinder block pintle mounted in said casing about a longitudinal axis;
a cylinder block rotatably mounted on said pintle;
a guide member rotatably mounted within said casing peripherally about said cylinder block on an axis parallel to said pintle axis;
a plurality of pistons movably mounted in said cylinder block radially of said pintle, each said piston having a foot at an outer end with a plane bearing surface bearing on a plane guide surface of said guide member;
a lever pivotally mounted in said casing about a third axis parallel to said pintle axis, said lever being secured to said pintle for moving said pintle to relocate said pintle axis relative to said guide member axis; and
a guide means including a pair of disc-shaped guide elements for laterally guiding said lever and said pintle within said casing during pivoting of said lever about said third axis, each said guide element being disposed at an opposite end of said pintle with one guide element between said pintle and rotatable guide member and the other guide element between said lever and casing.

3,955,478

HYDRAULICALLY POWERED PERCUSSION DRILL

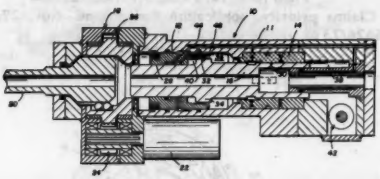
Jacob Edward Feucht, Sidney, Ohio, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 29, 1973, Ser. No. 410,939
Int. Cl.² B25D *9/00*; F01B *11/02*
U.S. Cl. 92—85 B **1 Claim**

1. A hydraulically powered percussion drill comprising:
an elongate housing having first and second ends, first and second chambers therein adjacent said first and second ends, a bore of smaller diameter than said first chamber extending from said first chamber through said first end, an overtravel portion in said first chamber of a diameter intermediate said bore and first chamber and first and second annular grooves in said bore spaced at a distance from said overtravel portion;

an elongate striker piston located in said housing for reciprocating movement, said piston including a first end portion fitting closely and slidingly disposed in said bore, a second end portion partially disposed in said first chamber and extending into said second chamber and an annular flange between said end portions sized to fit relatively closely into said overtravel portion to permit restricted fluid flow thereacross, said first end portion being of smaller diameter than said second end portion;

an annular seal located in said first annular groove in said bore in sealing engagement with said housing and the first end portion of said piston;



a first passageway in said housing providing fluid communication between said first annular groove in said bore and a low pressure area in said drill, said passageway having one end intersecting said first groove between said annular seal and said overtravel portion; and

a second passageway in said housing providing fluid communication between said second annular groove in said bore and said first chamber outside of said overtravel portion, said second passageway having one end intersecting said a second annular groove in said bore between the intersection of said first passageway with said first groove and said overtravel portion, whereby the pressure in said first chamber and overtravel portion are substantially equal, preventing stalling of said piston when said flange is in said overtravel portion.

3,955,479

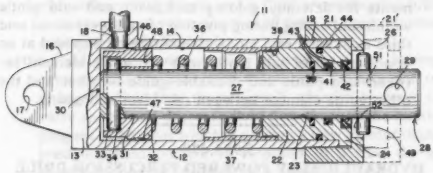
FLUID PRESSURE OPERATED ACTUATOR WITH SAFE DISASSEMBLY MEANS

Walter L. McLuckie, Coal City, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed June 10, 1974, Ser. No. 477,759

Int. Cl.² F01B *31/00, 29/08;* **F16J** *11/04, 15/18*

U.S. Cl. 92—128 **2 Claims**



1. A fluid pressure operated actuator comprising:

a cylindrical housing having at least one open end;

a disengageable end closure fastened to said open end of said cylinder;

a piston rod extending into said cylindrical housing for axial movement relative thereto between a contracted position and an extended position;

spring means within said cylindrical housing for urging said piston rod towards a predetermined one of said positions; wherein said spring means includes at least one compression spring disposed coaxially around a portion of said piston rod within said cylindrical housing;

means for admitting pressurized fluid into said cylindrical housing for forcing said piston rod towards the other of said positions against the force of said spring means;

a first annular spring retainer disposed coaxially within said open end of said cylindrical housing and having said spring abutted thereagainst, and a second annular spring retainer disposed coaxially within said cylindrical housing and being abutted against the other end of said spring and being slidable within said housing with said piston rod; and

stop means for limiting relaxation of said spring means as said end closure is being disengaged from said cylindrical housing, wherein said stop means includes an element carried on said piston rod in position to be abutted by said first spring retainer as said first spring retainer is urged out said open end of said housing by said spring as said end closure is in the process of being removed from said housing, said stop means being a cross pin extending transversely through said piston rod and having ends extending radially therefrom to block movement of said first spring retainer along said piston rod after said end closure has been partially disengaged from said cylinder.

3,955,480

SPRING-LOADED BRAKE CYLINDER FOR AN AIR BRAKE SYSTEM OF A RAILWAY VEHICLE

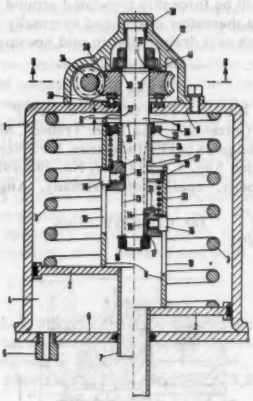
Bernd Wosegien, Munich, Germany, assignor to Knorr-Bremse GmbH, Munich, Germany

Filed Sept. 25, 1974, Ser. No. 509,035

Claims priority, application Germany, Dec. 1, 1973, 2359967

Int. Cl.² F01B *31/00*

U.S. Cl. 92—130 R **7 Claims**



1. A spring-loaded brake cylinder for an airbrake system of a railway vehicle and having an auxiliary release device, comprising a cylinder having a piston therein and a first spring acting on one side of the piston to load the same and the other side of the piston being subjected to a pressure medium introduced into the cylinder, a first screw coupling comprising first and second coupling members, said first coupling member comprising a threaded shaft having a reversible thread thereon rotatably mounted within said cylinder and supported axially against a portion of the cylinder, said second coupling member comprising a nut threaded upon said shaft, said nut having a pin radially extending therefrom, a tubular member attached to said piston and surrounding said nut, said tubular member having a longitudinal slot therein receiving said pin to nonrotatably mount said nut for axial displacement with respect to said first coupling member, first friction coupling means at the end of said tubular member away from said piston for

coupling said second coupling member to said piston against the force of said first spring when a pressure medium acts upon said other side of the piston, an actuation device mounted on the exterior of said cylinder and comprising a rotatable member mounted on said threaded shaft and means for selectively rotating said rotatable member to define the auxiliary release device, second coupling means actuated by axial displacement of said threaded shaft for coupling said threaded shaft to said rotatable member only when the pressure acting against said piston is below a predetermined value, and a second spring between said tubular member end and said second coupling member acting upon said second coupling member in the same direction that said first spring loads said piston and in the direction to displace axially said first coupling member to engage said second coupling means.

3,955,481

APPARATUS FOR ADHERING TRAVELING STRIP MATERIAL TO FOLDED BLANK BOXES

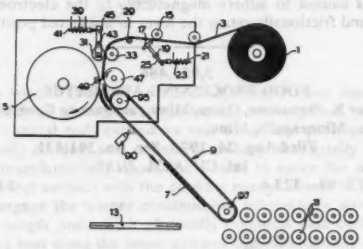
Gunter Heitmann, Lubeck, Germany, assignor to Genco International, Hamburg, Germany

Filed Sept. 16, 1974, Ser. No. 506,533

Claims priority, application Germany, Sept. 14, 1973, 2346368

Int. Cl.² B31B *1/72*

U.S. Cl. 93—36.9 **8 Claims**



1. An apparatus for progressively feeding folded blank boxes and a predetermined length of severed strip material to be assembled therewith to an assembly station comprising, a supply source for a traveling length of strip material, first means for advancing a leading edge of said strip to a severing station, back-up means in said station adapted to provide a support surface for the advancing strip, and cutter means arranged to cooperate with said back-up means to permit severing a strip of predetermined length from said traveling length of material, means for advancing said severed strip to a conveyor means, means for activating the severed strip while on said conveyor means to prepare it for attachment to the folded blank box power-operated braking means are included to stop strip travel to the activation means upon failure of boxes to flow to said conveyor and further means coupled with said first means for advancing said strip to a point of assembly with the blank box and thereafter discharging the box from the apparatus.

3,955,482

TRAY FORMING AND WELDING MACHINE

Lenard E. Moen, 7914 Michigan, Whittier, Calif. 90602

Filed Aug. 13, 1974, Ser. No. 496,928

Int. Cl.² B31B *3/26, 1/46*

U.S. Cl. 93—51 R **10 Claims**

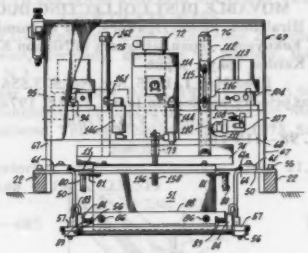
1. Apparatus for erecting and heat welding flat blanks with foldable walls having thermoplastically bondable pairs of corner joint areas, one of said joint areas comprising a corner tab extension of a wall of the blank and the other of said joint areas comprising the corresponding area of another wall onto which the corner tab is to be folded after erection of the foldable walls, said apparatus comprising;

a die cavity including rigidly fixed die walls;

a mandrel mounted for reciprocation into and out of said die cavity;

one end of said die cavity having a first station comprising camming surfaces of said die walls to fold the walls of the blank into erected position when said mandrel initially enters said cavity;

adjacent ends of said die walls defining corner voids of said die cavity providing clearance for the extension therethrough of an unfolded corner tab and for the exposure therethrough of the corresponding area of an erected wall onto which the corner tab is to be folded through said void;



said die cavity having a second station, intermediate opposite ends of said die cavity, comprising a heat source for each of said corner voids, each of said heat sources being positioned and arranged for heating a corresponding pair of corner joint areas during a second increment of movement of said mandrel and blank into said die cavity through said second station;

and a third station of said die cavity comprising means at each of said corner voids to fold the corner tab through said void to bring the thermoplastically bondable corner joint areas of the blank into mutual contact during a third increment of movement of said mandrel into said die cavity.

3,955,483

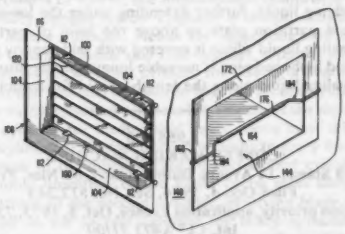
QUICK MOUNTING MEANS FOR GRILLES

Raymond B. Sunter, St. Petersburg, Fla., assignor to Sunbros Corporation, St. Petersburg, Fla.

Filed Sept. 17, 1974, Ser. No. 506,712

Int. Cl.² F24F *13/00*

U.S. Cl. 98—114 **1 Claim**



1. A quick mounting and dismounting grill for ventilator shaft openings or the like which comprises (i) a ventilator grille, (ii) a mounting means for mounting said ventilator grille in a ventilator shaft opening or the like, said mounting means utilizing inward spring pressure to achieve said mounting, and

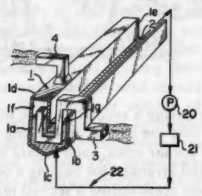
said mounting means comprising a tube, a tension spring slidable mounted in said tube, and an arm member mounted on each end of said tension spring and which each hook over a lip of the outside rim or facing of said ventilator shaft opening, and (iii) at least one clip means wherein said mounting means is mounted and which is detachably affixed to appendages, walls, vanes or the like on the backside of said ventilator grille by the inward spring lever pressure of the end portions of the two legs of said clip means, said clip means containing a body means which snugly fits around said tube and holds said mounting means enough above said appendages of said grille so that said arms can be moved and can extended to the edges of said grilles in order to allow hooking over said lips of said ventilator shaft opening.

3,955,484

MOVABLE DUST COLLECTING DUCT

Keijiro Hirahama; Fumio Ogawara, and Katsumi Matsuzaki, all of Fukuyama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed May 1, 1975, Ser. No. 573,556
Claims priority, application Japan, June 5, 1974, 49-62796
Int. Cl.[2] F23J *11/00*
U.S. Cl. 98—115 VM **4 Claims**



1. A movable dust collecting device comprising:

a fixed duct means including a duct having a length over-which a pipe is movable, said duct having a generally U-shaped cross section, the generally U-shaped duct being comprised of two side plates and a bottom plate; a substantially vertically oriented partition plate having a length substantially cooresponding to the length of said duct and located substantially in the middle of said generally U-shaped duct, the lower end of said partition plate being spaced from said bottom plate; and a canopy mounted over the space between the upper end of one of said side plates and the upper end of said partition plate;

an exhaust pipe mounted through said canopy;

sealing liquid in said fixed duct such that the level of said sealing liquid is always above the lower end of said partition plate; and

a generally S-shaped movable pipe extending from outside the upper end of the other of said side plates into said sealing liquid, further extending under the lower end of said partition plate to above the level of part of said sealing liquid which is covered with said canopy whereby said S-shaped pipe is movable longitudinally through said sealing liquid along the length of said fixed duct means.

3,955,485

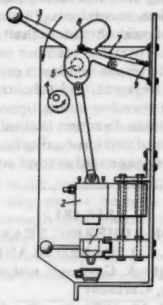
COFFEE MAKING MACHINE

Roland Stasse, 14 Avenue Dufourmantel, 06 Nice, France

Filed Oct. 4, 1974, Ser. No. 512,343
Claims priority, application France, Oct. 5, 1973, 73.36107
Int. Cl.[2] A47J *31/00*
U.S. Cl. 99—287 **3 Claims**

1. In a coffee making machine having a support structure and a manually-operable pressure lever to maintain pressure on the ground coffee pivoted on said support structure for rotation about an axis between a rest position and a pressure-applying position, the improvement which comprises, in combination: means to hold said lever in selected position and comprising,

an electromagnet positioned adjacent to said pressure lever, and



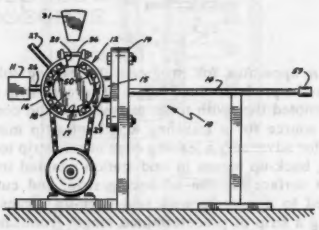
a magnetic-metal plate on said lever, said plate being so positioned in relation to the electromagnet and of such length that a portion of the plate is adjacent to the electromagnet in all positions of pivoting of the lever, whereby upon energising of the electromagnet the plate is caused to adhere magnetically to the electromagnet and frictionally retain the lever in a selected position.

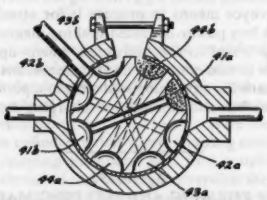
3,955,486

FOOD PROCESSING APPARATUS

Palmer K. Strommer, Osseo, Minn., assignor to General Mills, Inc., Minneapolis, Minn.

Filed Aug. 24, 1973, Ser. No. 391,431
Int. Cl.[2] A23L *1/18*
U.S. Cl. 99—323.4 **3 Claims**





1. In apparatus for processing heat and pressure reactive particulate food material, said apparatus including an elongated cylinder, inlet feeding means adjacent a first end of said cylinder for feeding said particulate material to said cylinder, outlet means adjacent the other end of said cylinder, said outlet means defining a restrictive orifice; and a gaseous fluid source interconnected to said inlet feeding means; the improvement wherein said inlet feeding means comprises a ro-

tary valve including means for continuously supplying gaseous fluid from said fluid source to said cylinder, said rotary valve including a rotatable plug and a valve housing for rotatably supporting said plug, said valve housing including a gaseous fluid inlet adjacent a first side of said housing and a gaseous fluid outlet adjacent the opposite side of said housing, said continuous fluid supply passing through said rotatable plug, said plug including a plurality of feeding sets, each of said sets including a passageway extending radially through said plug and a pair of pockets, one of said pockets being disposed at the radially outer ends of said passageway.

3,955,487

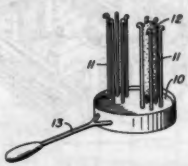
WIENER CHARCOAL BROILER

Nicholas J. Chetta, Jr., 5865 Memphis St., New Orleans, La. 70124

Continuation-in-part of Ser. No. 342,372, March 9, 1973, abandoned. This application Nov. 25, 1974, Ser. No. 527,172

Int. Cl.² A47J *29/00, 37/00*

U.S. Cl. 99—384 **2 Claims**



1. A wiener charcoal broiler comprising at least one heat sink block of aluminum for collecting cooking heat, wiener support metal rods carried by said block and positioned to physically conduct said collected cooking heat axially along and circumferentially about the wiener to space the wiener from direct contact with the cooking energy source to physically engage the wiener continuously substantially along its entire length and which physically conducts said collected cooking heat along the major axis and circumferentially of the wiener from said collecting block to the wiener without exposing the wiener directly to the cooking energy source.

3,955,488

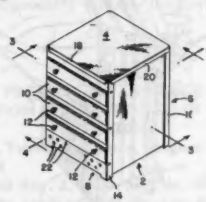
FOOD DEHYDRATER

Jack I. Wheeler, 7855 S. 114th, Seattle, Wash. 98178

Filed Oct. 29, 1974, Ser. No. 518,478

Int. Cl.² A23L *3/00*

U.S. Cl. 99—483 **6 Claims**



1. A device for dehydrating food products or the like wherein the particular combination and placement of elements renders the device self-regulating, comprising:

a. rectangular box-like enclosure means comprising imperforate sides, a vented rear element, a vented front element including access openings to receive supporting trays, a perforate bottom element and an easily removable top element,

b. heating means located in the bottom of the enclosure means to provide a predetermined quantity of regular, slow heat evenly distributed throughout the enclosure, and

c. a plurality of perforate food supporting trays, each movable horizontally within the enclosure means from a closed position for dehydrating the material, to an open position for loading and unloading, said trays when in the closed position, closing the openings in the front element of the enclosure means and extending rearwardly to terminate spaced from the back of the enclosure forming a vertical chimney open to the interior to the enclosure along the rear element whereby the heated air is able to freely flow upwardly generating a consistent temperature throughout the interior of the enclosure.

3,955,489

PROCESS FOR CONTINUOUSLY PRODUCING A ROASTED COCOA MASS AND FOR MANUFACTURING A CHOCOLATE MASS

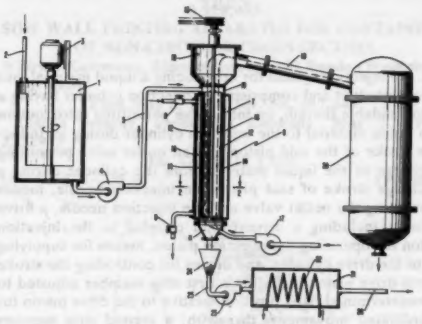
Paul Martin Goerling, and Klaus Paul Ernest Zuercher, both of Hannover, Germany, assignors to Nabisco, Inc., East Hanover, N.J.

Division of Ser. No. 311,664, Dec. 4, 1972, Pat. No. 3,904,777, which is a continuation-in-part of Ser. No. 120,596, March 3, 1971, abandoned. This application Mar. 21, 1975, Ser. No. 560,600

Claims priority, application Germany, July 21, 1970, 2036202; Aug. 4, 1972, 2238519

Int. Cl.² A23G *1/02*

U.S. Cl. 99—485 **1 Claim**



1. In an apparatus for continuously producing a roasted cocoa composition, wherein the shells of raw cocoa beans are removed prior to crushing the beans into a relatively liquid cocoa mass, whereupon the liquid cocoa mass is roasted under pressure, the upper limit of which is atmospheric pressure, by means of indirect heat application for heating the cocoa mass to a maximum of 150°C, the improvement comprising a first substantially upright hollow cylinder, a second substantially upright hollow cylinder, means for supporting said second cylinder coaxially inside said first cylinder, separate inlet and outlet means for said first cylinder for flowing a heating medium through said first cylinder to heat the second cylinder on its outer surface, further separate inlet means at the top of said second cylinder for feeding said liquid cocoa mass into said second cylinder at the top thereof, whereby to apply the liquid cocoa mass to the inner surface of said second cylinder for gravitational downflow of the liquid cocoa mass along said inner surface of the second cylinder, revolving blade means supported in the second cylinder for thinly spreading the liquid cocoa mass onto the inner cylinder surface of the second cylinder, further separate outlet means for removing roasted cocoa mass from said second cylinder at the lower end thereof, cooling means connected to said further outlet means for instantly contacting the roasted cocoa mass with a cooling temperature, the upper limit of which is 80°C, third inlet

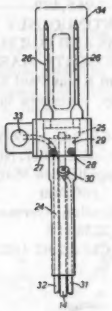
means connected to the lower end of said second cylinder for admitting thereto an upwardly flowing gas or vapor stream which intimately contacts said thin layer downwardly flowing cocoa mass while it is being roasted and third outlet means connected to the top of said second cylinder for removing said gas or vapor stream from said second cylinder.

3,955,490

INJECTION SYSTEM FOR MEAT PRODUCTS

Donald Richard North, Starling House, Lodge Lane, Salfords, Surrey, England

Filed Oct. 15, 1974, Ser. No. 514,803
Int. Cl.² B02B *3/12*
U.S. Cl. 99—532 **5 Claims**



1. An injection system for introducing a liquid material into a meat product and comprising an injection cylinder having a piston slidable therein, an inlet valve permitting introduction of a liquid material to the injection cylinder during an induction stroke of the said piston and an outlet valve permitting discharge of the liquid material from the cylinder during a discharge stroke of said piston, an injection needle, means connecting the outlet valve and the injection needle, a drive cylinder including a drive piston coupled to the injection piston for operating the injection piston, means for supplying air to the drive cylinder, and means for controlling the stroke of the drive piston including a first stop member adjusted to a predetermined fixed position relative to the drive piston for coordinated movements therewith, a second stop member fixed relative to the drive cylinder, said second stop member having an occlusion orifice positioned to be engaged and closed by a confronting surface portion of the first stop member when the drive piston reaches a predetermined stroke position, and an air control circuit connected to the occlusion orifice, the air control circuit being arranged to cease application of the force moving the drive piston and first stop member toward the second stop member upon closure of the occlusion orifice by the first stop member.

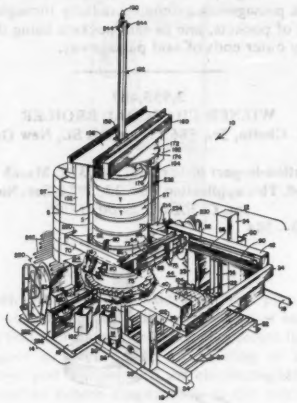
3,955,491

AUTOMOTIVE TIRE STACKING AND STRAPPING MACHINE

Michael J. McMahon, Palatine, Ill., assignor to Signode Corporation, Glenview, Ill.

Filed Mar. 4, 1975, Ser. No. 555,142
Int. Cl.² B65B *13/04, 13/18*
U.S. Cl. 100—7 **11 Claims**

1. In an article stacking and strapping machine, in combination, a machine framework establishing a forward stacking station and a rearward strapping station, means at said stacking station defining a support adapted to receive successive articles thereon, a vertically shiftable lift member movable between a lower position wherein it underlies an article or said support and a raised position wherein it engages and elevates such article to a stacking level, means for actuating said lift member, a pair of opposed article-supporting foot members movable in unison toward and away from each other substantially at said stacking level between inner positions wherein they engage and underlie the peripheral regions of the lowermost article in a stack at said stacking level and serve to support the same, and outer positions wherein they release such article, means for moving said foot members, means



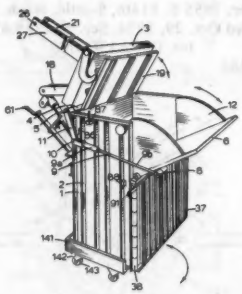
effective when said lift member and foot members have thus upstacked a predetermined number of articles at the stacking station for shifting said foot members, and consequently the stack of articles supported thereby, rearwardly to the strapping station, and for thereafter moving said foot members to outer positions to release the stack and thus deposit the same in the strapping station, and means at said strapping station for applying binding straps vertically to the thus deposited stack.

3,955,492

BALER

Michael A. J. Topolay, Acton, Canada, assignor to Lo-Lift Corporation, Mississauga, Canada

Filed Mar. 10, 1975, Ser. No. 556,698
Int. Cl.² B30B *15/30, 15/32*
U.S. Cl. 100—215 **7 Claims**



1. A baler comprising a container having an open upper end for introducing material to be baled, a platen mounted on a support at the upper end of the container and movable relative to the support in up and down movement in the container, connecting means between the support and the container permitting the support together with the platen to be swung upwardly toward a rear side of the container, a door pivotally connected on the container at an upper region of a front side

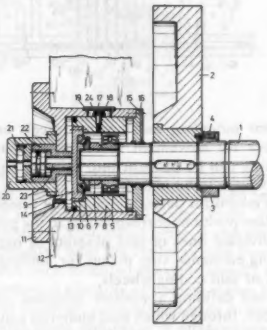
thereof, first drive means operable to move the platen up and down in the container for compressing material therein, second drive means operable to swing the platen together with the support upwardly and rearwardly and to return them downwardly and forwardly, and linkage means between the support and the door providing for the door to swing forwardly and downwardly as the platen and the support swing upwardly and rearwardly.

3,955,493

FRICTION DISC SPINDLE PRESS

Harald Hany, Kassel, and Gerhard Broder, Dusseldorf, both of Germany, assignors to Franz Berrenberg, Haan, Germany

Filed Aug. 19, 1974, Ser. No. 498,587
Claims priority, application Germany, Aug. 20, 1973, 2341945
Int. Cl.² B30B *1/18*
U.S. Cl. 100—289 6 Claims



1. A friction disc spindle press having a press frame, which includes: a countershaft having two ends and being axially displaceably arranged in said press frame, two side discs spaced from each other in the axial direction of said countershaft and fixedly connected thereto for rotation and axial movement therewith, two pairs of antifriction bearings respectively mounted on the two ends of said countershaft for supporting the latter, each of said pairs comprising a self-aligning radial bearing and a self-aligning axial bearing, two bushing means respectively associated with said pairs of antifriction bearings and having the latter mounted therein, and two bearing housing means respectively associated with said bushing means and reciprocably slidably supporting said bushing means.

3,955,494

DEVICE FOR PREVENTING AN IMAGE OF A PRINTING MASTER FROM BEING PRINTED IN AN INCLINED POSITION

Minoru Suzuki, Yokohama, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Aug. 2, 1974, Ser. No. 494,327
Claims priority, application Japan, Aug. 10, 1973, 48-89812
Int. Cl.² B41F *13/14*
U.S. Cl. 101—232 5 Claims

1. A device for preventing an image of a printing master from being printed in an inclined position with respect to the margins on rectangular copy sheets to which the image is transferred in a duplicating apparatus of the type comprising:

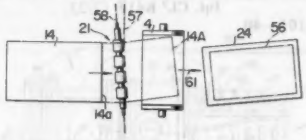
means for cyclicly transporting the printing master through a printing position;

means for feeding copy sheets one by one along a predetermined path of movement to said printing position in a direction substantially perpendicular to the leading edges of said copy sheets; and

means cooperating with said transporting means at said printing position for transferring the image on said printing master to said copy sheets;

said device comprising:

means disposed across said predetermined path of movement for receiving said copy sheets from said feeding means and transporting said copy sheets to said printing position;



said receiving means comprising a pair of cooperating feed rollers; and

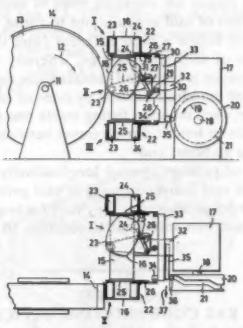
means for selectively varying the orientation of said feed rollers with respect to the leading edges of said copy sheets received thereby to alter the orientation and direction of movement of said copy sheets prior to entering said printing position by such an amount that will compensate for any inclination of the printing master at the printing position.

3,955,495

SIDE WALL PRINTING APPARATUS FOR CONTAINERS OF NON-CIRCULAR CROSS-SECTION

Wilfried Kammann, Elsemuhlenweg, 498 Bunde (Westfalen), Germany

Filed May 6, 1974, Ser. No. 467,245
Claims priority, application Germany, May 7, 1973, 2322975
Int. Cl.² B41F *17/26*
U.S. Cl. 101—38 A 11 Claims



1. A printing machine comprising a rotary printing drum, a transporting element having a plurality of supports for dished articles to whose surface printed matter is to be applied and being arranged for intermittent indexing of said supports into printing relationship with said printing drum at a printing station, drive means for said printing drum and transporting element, said supports each comprising a first arbor rotatable about its longitudinal axis and operative to support said article inside said article and at least one additional arbor arranged to be displaceable from a first position in which it is laterally spaced a first distance from said first arbor and operative to support said article inside said article to a second position laterally spaced a second distance from said first arbor inside said article in which second position it is inoperative to support said article, and means for cyclically moving said at least

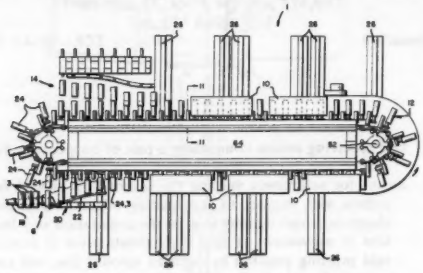
one additional arbor between said first and said second positions at said printing station.

3,955,496

LINEAR CAN PRINTER

Joseph J. Urban, Pleasantville, N.Y., assignor to Crown Cork & Seal Company, Inc., Philadelphia, Pa.

Filed Sept. 17, 1974, Ser. No. 506,907
Int. Cl.² B41F 17/22
U.S. Cl. 101—40 **17 Claims**



1. Apparatus for printing on cans and similar cylindrical objects comprising:

a conveyor for transporting said cylindrical objects between a feed station and a discharge station, said conveyor having linear and curved portions and comprising a plurality of rigid links coupled to one another by articulations;

sprocket means disposed at at least one of said curved portions and including means for engaging ones of said links adjacent first ones of said articulations to urge said conveyor along a predetermined path;

a stationary curved track disposed proximately to said sprocket means for engaging ones of said links adjacent second ones of said articulations to cause the latter articulations to follow a path different from the path of said first ones of said articulations, whereby the velocity of said conveyor is rendered substantially constant;

a plurality of mandrels carried by ones of said links of said conveyor, each mandrel fitting inside one of said cylindrical objects to hold it during travel between said feed and discharge stations; and

a plurality of printers spaced longitudinally along a linear section of said conveyor, ones of said printers contacting said cylindrical objects as they pass for sequentially printing at least two interrelated patterns to form a design thereon.

3,955,497

BAR CODE PRINTING DEVICE

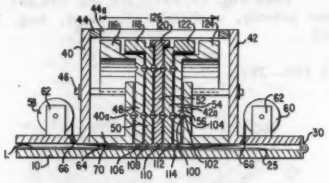
James Rawlings Sydnor, 1215 Palmyra Ave., Richmond, Va. 23227

Filed Sept. 18, 1974, Ser. No. 507,293
Int. Cl.² B41J 1/40, 1/54
U.S. Cl. 101—93.25 **7 Claims**

1. An apparatus for printing bar-half bar codes on mailing envelopes comprising:

a support member;

a plurality of individually rotatable coding wheels adapted to be individually manually rotated by a user to the desired positions, each of said coding wheels having a plurality of bar-half bar code printing elements along a portion of the peripheral edge surface thereof and a like number of numerals individually corresponding to each of said plurality of bar-half bar code printing elements along a further portion of said peripheral edge surface, each printing element being located diametrically opposite to the numeral corresponding thereto so that rotation of a said coding wheel to a selected position wherein a desired numeral is selected to be printed in code causes the corresponding printing elements to be moved to a printing position, the width of said portion of the peripheral edge surface of said coding wheels containing said numerals being adapted to be directly manipulated by a user and being greater than the width of the edge surface containing said printing elements so as to facilitate manual manipulation of said coding wheels, the said portions of said edge surfaces containing said printing elements being closely spaced laterally so as to print the bar-half bar symbols in close spaced relationship;



means for mounting said coding wheels on said support member for movement therewith so that said printing elements can be brought into printing engagement with an envelope to be coded;

a detent means for detenting said code wheels in a plurality of detent positions corresponding to the printing positions of individual ones of said plurality of bar-half bar code printing elements, stop means for limiting the rotational travel of said coding wheels,

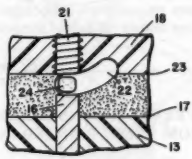
and means defining a window mounted on said support member, through which said numerals can be viewed, for permitting access to the further portions of said edge surface of the coding wheels containing said numerals so as to provide direct manipulation of the coding wheels.

3,955,498

ELECTROMAGNETICALLY ACTUATED PRINTER

Thaddeus LeRoy Scott, 360 Hyde Drive, Hayward, Calif. 94544

Filed Mar. 27, 1975, Ser. No. 562,633
Int. Cl.² B41J 7/32; B41K 1/08
U.S. Cl. 101—93.31 **5 Claims**



1. A printing apparatus comprising a first, elastic member having a plurality of indicia forming segments embedded therein; a second, rigid member joined to said first member with an elastomeric layer interposed therebetween; a plurality of electromagnets embedded in said second member, each aligned with one of said indicia forming segments, actuator means disposed between each of said electromagnets and each of said indicia forming segments, said actuator means including a plurality of channels, each channel disposed between one of said electromagnets and the respective indicia forming segment, and a ferromagnetic actuator freely disposed within each of said channels to be selectively latched by the activation of the respective electromagnet in a force transferring

position between said second member and said indicia forming segment for subsequent printing.

3,955,499

ROTARY RUBBER STAMP

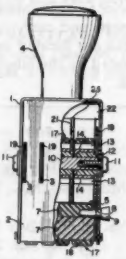
Takaji Funahashi, No. 1, 2-Chome, Kitatakasho, Nishi, Nagoya, Aichi, Japan

Filed May 6, 1974, Ser. No. 466,867

Claims priority, application Japan, May 28, 1973, 48-63270[U]; Oct. 15, 1973, 48-119587[U]

Int. Cl.[2] **B41J** *1/20*

U.S. Cl. 101—111 **1 Claim**



1. A rotary rubber stamp consisting of a frame body, a metal cover having side openings, an inverted U-shaped bridge piece mounted at the lower end of said frame body, ink storage means in the interior of said bridge piece, a plurality of cylinders rotatably mounted near the center of said frame body, a plurality of wheels each mounted coaxially about a respective one of said cylinders, a plurality of endless stamp belts made of porous rubber material, each of said belts being mounted around said bridge piece and being in engagement with said ink storage means and around a respective one of said wheels, a plurality of rotary discs each secured to a respective one of said cylinders, each said disc being spaced from the wheel mounted about said one cylinder, said rotary discs being so positioned as to have their peripheries partially projecting out of said side openings, to enable said wheels and belts to be rotated, and a plurality of pairs of partition plates, each pair surrounding a respective disc, one plate of each said pair being positioned between said respective disc and the wheel which is rotated thereby, the other plate of each said pair being positioned between said respective disc and the wheel adjacent thereto which is not rotated thereby, said partition plates being secured to and inside said frame body, the sides of each of said wheels contacting two adjacent partition plates whereby said partition plates prevent the ink from said endless stamp belts from contaminating the respective rotary discs.

3,955,500

TYPE BAND IDLER PULLEY MECHANISM

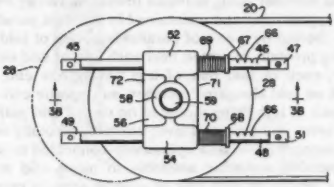
Frank A. Mahoney, Wyncote, and Raymond J. Fonte, Conshohocken, both of Pa., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Feb. 5, 1975, Ser. No. 547,422

Int. Cl.[2] **B41J** *1/20*

U.S. Cl. 101—111 **2 Claims**

1. In a printer in which an endless type character band is driven about a drive pulley and about a freely rotating idler pulley by a drive motor, the improvement comprising: a detachable coupling connecting the drive motor and the drive pulley; a print station support means; first and second rail means secured to said support means, said first and second rail means each having a plurality of notches formed therein; an idler pulley trolley slideably mounted on said first and second rail means; first and second retaining ring means formed to fit into any one of said notches respectively of said first and second rail means and with said first retaining ring means disposed in a notch in said first rail means and said second retaining ring means disposed in a notch in said second rail means and with both said first and second retaining ring means disposed between said idler pulley trolley and said drive pulley; an idler pulley shaft carried by said trolley for mounting said idler pulley on said trolley, said idler pulley mounted on said idler pulley shaft to move in a vertical direction therewith; means for adjusting the vertical position of said idler pulley shaft on said trolley; spring compression means mounted on



said first and second rail means and interposed between a side of said trolley and said first and second retaining ring means whereby said trolley is forced away from said retaining ring means to maintain a predetermined tensioning force on said type character band as said band is rotated about said pulleys and said plurality first retaining ring means being locateable in any one of said plurality of notches on said first rail means and said second retaining means being locateable in any one of said plurality of notches on said second rail means whereby a number of different sizes of type character bands can be held under tension as each is used with said printer.

3,955,501

SQUEEGEE AND FLOOD BAR ACTUATOR

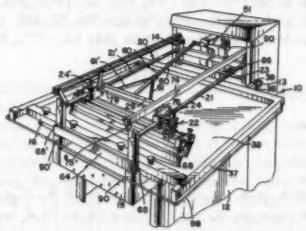
Henry J. Bubley, Deerfield, and Claude H. Oltra, Chicago, both of Ill., assignors to American Screen Printing Equipment Company, Chicago, Ill.

Filed Jan. 23, 1974, Ser. No. 435,850

The portion of the term of this patent subsequent to Jan. 14, 1992, has been disclaimed.

Int. Cl.[2] **B41F** *15/36*

U.S. Cl. 101—123 **6 Claims**



1. In a printing press including a support frame, a bed supported on said frame and having an upwardly facing surface to receive work to be printed, a printing frame pivotally mounted on said support frame for angular movement relative thereto, a pair of support arms mounted on said printing frame for pivotal movement therewith toward and away from a printing bed, a chase pivotally mounted beneath said pair of support arms and being positioned over said work on said bed, a screen removably mounted on said chase, a carriage assembly mounted on said pair of support arms for movement therealong relative to said chase and screen, said carriage assembly having a squeegee and flood bar mounted for movement

relative to one another thereon, a drive arm pivotally mounted on said support frame and operatively connected to said carriage assembly, and press drive means operatively connected to said drive arm to drive said drive arm and thereby move said carriage assembly reciprocally along said pair of support arms during a press cycle, the improvement including a carriage assembly actuating assembly mounted on said printing frame in generally parallel relationship to said pair of support arms, said actuating assembly having an elongated member operatively connected to said squeegee and flood bar by an actuator lever movable along said elongated member, said elongated member being movable toward and away from said pair of support arms and maintained in constant parallel relationship thereto by a pair of parallel legs, one of said pair of legs being pivotally mounted near each end of said elongated member, each of said pair of legs having one end thereof mounted on said elongated member, an opposite end of each of said pair of legs being mounted on one of said pair of said support arms, and a control lever assembly pivotally mounted on said support frame and operatively connected to said carriage assembly actuating assembly to move said actuating assembly relative to said pair of support arms to reverse the respective positions of said squeegee and said flood bar during said press cycle in response to the movement of said printing frame relative to said support frame and said printing bed, said control lever assembly having a lower portion with a slot formed therein which is mounted over a fixed pivot pin attached to said support frame, said slot allowing said control lever assembly to slide relative to said pivot pin and said support frame while being pivoted relative thereto, and an upper connecting portion adjustable in length relative to said lower portion of said control lever assembly, an upper end of said upper connecting portion of said control lever assembly being pivotally connected to said actuating assembly, a locking dog mounted on said control lever assembly and engaging a locking pin fixedly mounted on said support frame as said control lever assembly slides by said slot relative to said pivot pin on said support frame, to thereby lock said control lever assembly into a selected position preventing linear movement of said control lever assembly relative to said pivot pin at selected times during said press cycle and prevent unwanted movement of said actuating assembly.

3,955,502

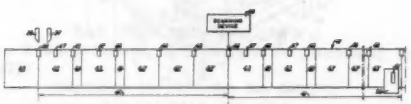
METHOD OF PRINTING LABELS

George W. von Hofe, Millington, N.J., assignor to NJM, Inc., Hoboken, N.J.

Division of Ser. No. 523,756, Jan. 28, 1966, Pat. No. 3,536,500, and a continuation of Ser. No. 58,446, July 27, 1970, abandoned. This application July 14, 1972, Ser. No. 271,978

Int. Cl.[2] B41F *5/16*

U.S. Cl. 101—426 **2 Claims**



1. The method of printing a continuous length of label web having printed thereon labels for containers of a given product which comprises visibly printing on one side of a continuous web a succession of label indicia peculiar to such given product and so arranged on the web that certain successive of such printed label indicia as a whole are abutting one another and other certain successive of such printed label indicia as a whole are spaced from each other by scrap sections to be cut away from the label indicia and having given lengths in the direction of the web length less than the length of each such printed label indicia as a whole, whereby the label indicia are printed on the web in unequally spaced relation, and printing at a printing station and on said one web side control elements for controlling the advance of the web in a labeling machine for applying the labels to articles, in association with the visible inks forming the label indicia in each of such labels and at a given localized area within the area of each label indicia printed as a whole on the web, so that in the longitudinal series thereof such control elements will be unequally spaced, and in the printing of such control elements at said printing station using an invisible ink, and as each control element is being printed, simultaneously printing at said printing station and on said one web side in registry with each invisible control element and with a visible ink a registry mark so as to provide a visible trace of the printed invisible control elements for the checking of the web prior to application of the severed labels to the product containers, and carrying out such printing so that such registry marks are located on portions of the web outside the areas occupied by the label indicia and severable from such label indicia.

3,955,503

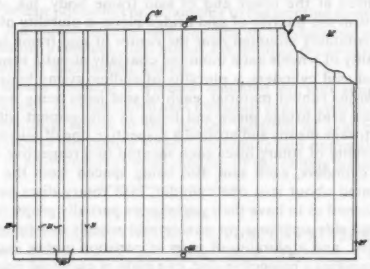
METHOD OF PRINTING LABELS BY THE OFFSET PRINTING PROCESS

George W. von Hofe, Millington, N.J., assignor to NJM, Inc., Hoboken, N.J.

Continuation of Ser. No. 58,566, July 27, 1970, abandoned, Division of Ser. No. 523,756, Jan. 28, 1966, Pat. No. 3,536,550. This application Oct. 5, 1972, Ser. No. 296,320

Int. Cl.[2] B41C *1/00;* **B41F** *5/04, 7/04*

U.S. Cl. 101—426 **5 Claims**



1. A method of printing repeat series of whole labels on a continuous web using an offset printing cylinder having a transverse fastening groove in which are secured together the end margins of an image vehicle mounted on such cylinder and which produces on the web between said repeats scrap sections to be cut away from the whole labels, said image vehicle having between the inner edges of such end margins a given fixed repeat length greater than the total of the dimensions of a plurality of certain whole label printing areas that can be contained in such repeat length in the direction of printing, comprising providing on said image vehicle between the inner edges of such end margins the maximum number of printing areas for said certain whole labels that may be contained in such repeat length and at least one nonlabel section having a web length equal to or a multiple of the web length of a scrap section formed on the web during printing because of said fastening groove, so that the total dimension of said nonlabel section or sections in the direction of printing and said total dimension of said whole label printing areas provides a complete repeat length equal to said given fixed repeat length, and so that said total dimension of said nonlabel section or sections does not exceed the dimension of a whole label printing area in the same direction, preparing such image vehicle so that said given fixed repeat length between the inner edges of said end margins thereof has certain of said printing areas in abutting relation, and at least one nonlabel section abutting at least one whole label printing area so that

those whole label printing areas which are not spaced by a nonlabel section are all abutting one another, and using such image vehicle so prepared on said offset printing cylinder to print on a continuous web repeats of said given fixed repeat length spaced by the scrap sections formed on the web by said fastening groove and each containing said maximum number of whole label printing areas and at least one scrap section which is produced by said at least one nonlabel section and which is to be cut away from said whole labels.

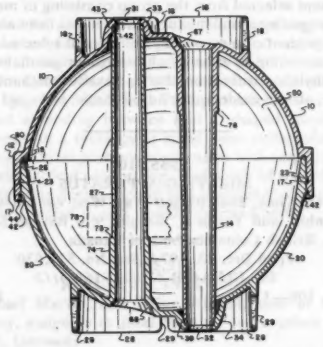
3,955,504
EXPLOSIVE BOOSTER CASING

Russell H. Romney, 3259 Bon View Drive, Salt Lake City, Utah 84109

Continuation of Ser. No. 337,434, March 2, 1973, Pat. No. 3,831,522. This application June 26, 1974, Ser. No. 483,212

Int. Cl.² F42B *3/02*

U.S. Cl. 102—24 R **11 Claims**



1. A molded booster shell or casing having wall elements enclosing a major cavity of substantially spherical shape for holding a charge of explosive booster composition, said shell or casing consisting essentially of a pair of generally similar and substantially hemispherical half shell members joined together in a sliding telescopic liquid tight adhesive-free joint lying substantially in an equatorial band around said cavity, said joint being sufficiently liquid tight in an initial partly closed position to permit filling of the major cavity with said charge without objectionable leaking at the joint, each of said half shell members comprising an integral hollow tube positioned near the center of mass of said cavity and projecting from the wall of one shell completely through the major cavity and frictionally sealable in said liquid tight relationship in an opening in the wall of the opposite shell, at least one of said tubes being sized and shaped to receive and retain a primary initiator in detonating position near the center of mass of said cavity, at least one of said tubes being arranged to leave a filler opening at said opening in the opposite wall when the parts are in said initial partly closed position and to close and seal said opening when said sliding telescopic joint is completely closed.

3,955,505
DETONATING APPARATUS

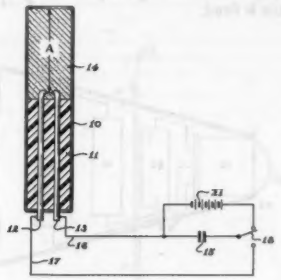
Lawrence H. Johnston, Minneapolis, Minn., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed May 31, 1950, Ser. No. 165,171

Int. Cl.² F42B *3/14*

U.S. Cl. 102—28 R **4 Claims**

1. Apparatus for detonation of high explosive in uniform timing comprising in combination, an outer case, spark gap electrodes insulatedly supported in spaced relationship within said case to form a spark gap, high explosive of the class consisting of pentaerythritol tetranitrate and trimethylene trinitramine substantially free from material sensitive to detonation by impact compressed in surrounding relation to said



electrodes including said spark gap under a pressure from about 100 psi to about 500 psi, said spark gap with said compressed explosive therein requiring at least 1000 volts for sparking, and means for impressing at least 1000 volts on said spark gap.

3,955,506
PROPULSIVE-CHARGE CASE

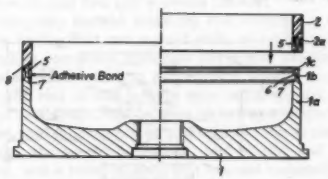
Hans Werner Luther, Buttgen, and Peter Bender, Dusseldorf, both of Germany, assignors to Rheinmetall G.m.b.H., Dusseldorf, Germany

Filed Jan. 18, 1974, Ser. No. 434,589

Claims priority, application Germany, Jan. 26, 1973, 2303790

Int. Cl.² F42B *5/30, 7/06*

U.S. Cl. 102—43 P **7 Claims**



1. A cartridge shell designed to contain a propulsive charge, comprising:

a metallic case stub with a cup-shaped body having a cylindrical peripheral wall provided at its rim with an internal peripheral recess forming an annular shoulder; and

a sealing ring of polymeric material engaging said rim and forming an axial extension of said peripheral wall with inner and outer surfaces flush with those of said body, said ring having an inner skirt received in said recess and resting against said shoulder, said inner skirt being in continuous contact with a reduced portion of said peripheral wall.

3,955,507
PROXIMITY FUSE

Richard T. Ziemba, Burlington, Vt., assignor to General Electric Company, Burlington, Vt.

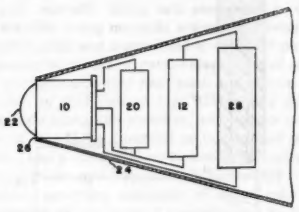
Filed Dec. 23, 1963, Ser. No. 332,970

Int. Cl.² F42C *13/02*

U.S. Cl. 102—70.2 P **1 Claim**

1. A method of detonating a high explosive (HE) projectile before it contacts a target comprising:

1. firing a first high explosive incendiary (HEI) projectile at a target, said first projectile containing a first explosive which produces an electromagnetic radiation of predetermined frequency and magnitude during combustion;
2. firing a second high explosive (HE) projectile at the target after said first high explosive indendiary (HEI) projectile is fired;



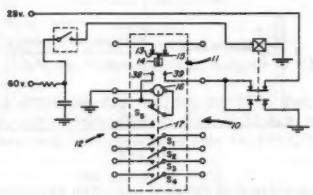
3. impacting said first high explosive incendiary (HEI) projectile on said target, said first projectile containing fusing means for detonating said first explosive on impact; and
4. detonating said second high explosive (HE) projectile by use of fusing means therein actuated solely by said electromagnetic radiation resulting from combustion of said first explosive on impact of said first high explosive incendiary (HEI) projectile on said target.

3,955,508

ACCELERATION INTEGRATING SWITCH

Albert S. Will, Bethesda, and Robert R. Wilson, Chillum, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 27, 1965, Ser. No. 430,509
Int. Cl.[2] F42C *11/00*
U.S. Cl. 102—70.2 R **4 Claims**



1. An acceleration responsive timing device comprising
a substantially cylindrical housing,
a motor and gearing contained within said housing,
a shaft coupled to said gearing to be rotated thereby at a predetermined rate, said shaft being coaxial with said cylindrical housing,
switch carrying discs mounted within said housing about said shaft, said switches being sequentially actuated upon rotation of said shaft,
a power source for said motor,
and acceleration responsive means for operatively connecting the power source to the motor only after the device has been subjected to a sustained acceleration of at least a predetermined level for at least a predetermined period of time said acceleration responsive means having a base attachable to said housing, an inertial mass slideably mounted on said base between initial and final positions, a follower slideably mounted on said base, resilient means coupling said follower to said inertial mass for movement therewith, and contact means mounted on said follower and said base and operable to perform switching functions in the motor input circuit upon movement of said follower.

3,955,509

FUEL-AIR MUNITION AND DEVICE

Gary A. Carlson, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Mar. 21, 1969, Ser. No. 809,440
Int. Cl.[2] F42B *11/24*
U.S. Cl. 102—90 **8 Claims**

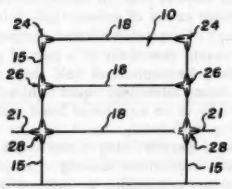
1. A device comprising a liquid fuel, means for delivering said liquid fuel under pressure to a desired location, means for there dispersing said liquid to form a detonable fuel-air cloud and means for thereafter initiating the detonation of said cloud at a predetermined time, said liquid fuel comprising essentially from about 70 to 95 mole percent of a primary component selected from the group consisting of methylacetylene, propadiene, and mixtures thereof and from about 30 to 5 mole percent of a secondary component selected from the group consisting of ethane, chlorotrifluoromethane, 1,1 difluoroethylene, trifluoromethane, hexafluoroethane, methyl fluoride, nitrous oxide, sulfur hexafluoride, and vinyl fluoride.

3,955,510

SHELVING APPARATUS

Mukerrem Kinik, 2040 Russett Way, West Vancouver, British Columbia, and Yalcin A. Eroglu, 990 Balsam St., White Rock, British Columbia, both of Canada

Filed Dec. 13, 1974, Ser. No. 526,630
Int. Cl.[2] A47B *47/00*; F16B *5/12*
U.S. Cl. 108—111 **11 Claims**



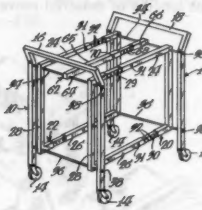
7. Shelving apparatus comprising a plurality of vertical shelving elements, a plurality of horizontal shelving elements extending at right angles to the vertical elements, and a plurality of connectors interconnecting the vertical elements to the horizontal elements, each connector comprising a body formed of stiff, slightly resilient material, said body having arms extending outwardly therefrom from a mid portion thereof and substantially normal to each other, a slot in each of said arms extending from near said mid portion and opening outwardly from outer ends of the arms and from sides of said arms to receive said elements and resiliently grip the latter, each of said arms being formed with outer dome-shaped faces that curve from thin edges of the arm outwardly to substantially the centre of the arm at the inner end thereof so that said each arm has narrow edges through which the slot of said arm opens outwardly and increases in thickness from said edges to said body centre, said dome-shaped faces reinforcing the arm and transferring the force of any prying or tipping effort of said elements to said body centre where the body is relatively thick as a result of the dome shape of the arm faces.

3,955,511

ADJUSTABLE STAND FOR APPLIANCES

Walter L. Bak, 22534 Pleasant Drive, Richton Park, Ill. 60471

Filed Feb. 3, 1975, Ser. No. 546,685
Int. Cl.[2] A47B 11/00
U.S. Cl. 108—137 8 Claims



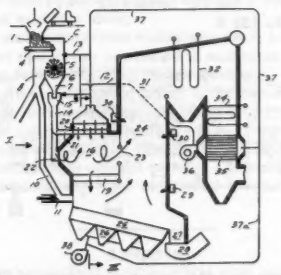
1. A stand for appliances and the like comprising a pair of spaced inverted U-shaped members, each of said U-shaped members defining an upper handle and a pair of vertical support legs for said stand, a pair of spaced rectangular structural members disposed within said U-shaped members in vertical planes and extending between said U-shaped members to define therewith a rectangular stand, said rectangular members having vertical portions coextensive with respective portions of said vertical support legs, and a pair of spaced tie rod means extending across each of said inverted U-shaped members and connected to said rectangular members.

3,955,512

REFUSE INCINERATOR

Walter Josef Martin, and Heinz Weiand, both of Munich, Germany, assignors to Josef Martin Feuerungsbau GmbH, Munich, Germany

Filed Oct. 29, 1974, Ser. No. 518,867
Claims priority, application Germany, Nov. 30, 1973, 2359730
Int. Cl.[2] F23G 5/00; F23M 3/18
U.S. Cl. 110—8 R 19 Claims



1. In a refuse incinerator, a combination comprising a main first combustion chamber having a lower end region; a burner grate in said lower end region; a second combustion chamber upwardly of said burner grate and independent of said first combustion chamber; discrete combustion air supply means for supplying combustion air to said second chamber; material supply means for supplying a mix of lighter and heavier refuse particles to said second combustion chamber, for combustion of the lighter particles therein; and admitting means for admitting the uncombusted particles of the mix from said second combustion chamber into said first combustion chamber and onto said burner grate for combustion thereon.

3,955,513

COMBINED CULTIVATING AND PARTICLED MATERIAL APPLYING GARDENING TOOL

Swan M. Akeyson, 762 Walnut, Long Beach, Calif. 90813

Filed Aug. 26, 1974, Ser. No. 500,410
Int. Cl.[2] A01C 7/00, 19/00
U.S. Cl. 111—8 3 Claims

1. A gardening device that is capable of being used to subject the ground surface to a raking action as well as a light hoeing action and to subsequently apply a metered quantity of a particled material that is beneficial to plant growth to the ground surface that has been cultivated by the device, said device including:

a. an elongate shaft having first and second end portions;

b. a plurality of tines having first and second end portions, said second end portions of said tines angularly disposed relative to said first end portions thereof;

c. an integrally formed assembly that includes a tubular sleeve having first and second ends, an elongate hopper extending outwardly from said sleeve and longitudinally disposed relative thereto, a cylindrical housing supported from the end of said hopper most adjacent said second end of said sleeve, said housing including two spaced end pieces, said housing having a particled material discharge opening therein situated below said second end of said sleeve, and a protuberance that extends outwardly from said second end of said sleeve, said protuberance having a plurality of spaced cavities that extend upwardly therein and frictionally engage said first end portions of said tines to support the latter from said assembly, and said sleeve having said second end portion of said shaft extending thereinto and secured thereto;

d. rotatable metering means in said housing, said metering means when in a first position receiving and holding a metered quantity of said particled material from said hopper through said second end thereof, and said metering means when pivoted to a second position discharging said metered quantity of said particled material by gravity through said discharge opening to fall to the ground surface, said rotatable metering means including:

1. a rod of circular transverse cross section journalled in said end pieces and extending therebetween, said rod having first and second arms extending outwardly from opposite ends thereof; and

2. at least a portion of a cylindrical shell in said housing rigidly secured to said rod, said shell having a metering chamber therein that receives said granular material from said hopper when aligned with said second end thereof, with said chamber discharging said granular material through said discharge opening when aligned

with the latter, and said manually operated means being pivotally connected to said first arm;

e. spring loaded means that engage said first arm and at all times tend to maintain said metering means in said first position;

f. a rod movably connected to said second arm and extending upwardly fron said second arm in a longitudinal position relative to said shaft; and

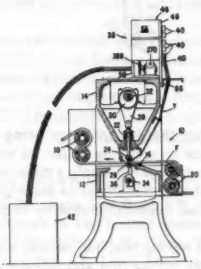
g. guide means on said shaft that slidably engage said rod and movably support said rod in said longitudinal position with said rod when moved longitudinally relative to said shaft in a first direction rotating said shall to dispense a metered quantity of said particled material through said discharge opening in said housing onto the ground surface.

3,955,514

YARN FEED ROLLER ASSEMBLY

Richard J. Prichard, Chattanooga, and Jimmie D. Scott, Harrison, both of Tenn., assignors to The Singer Company, New York, N.Y.

Filed Mar. 7, 1975, Ser. No. 556,233
Int. Cl.² D05C *15/32*
U.S. Cl. 112—79 A **12 Claims**



1. A feed roller assembly for a tufting machine pattern attachment comprising, a support, a multiplicity of parallel roller modules mounted in the support, each of said modules comprising a housing, a shaft rotatably journalled in the housing, a plurality of drive members rotatably journalled on said shaft, a yarn feed roller mounted on one end of said shaft adapted to feed yarn to at least one needle of the tufting machine, the amount of yarn fed being dependent on the speed of the roller, drive transmitting means in the support for driving corresponding drive members of said modules in unison at a speed different from the other drive members, a clutch associated with each drive member mounted on said shaft, means drivingly connecting each drive member to the respective associated clutch for rotating the clutch, each said clutch being operable when actuated to rotate said shaft, and means for selectively actuating the clutches of each module.

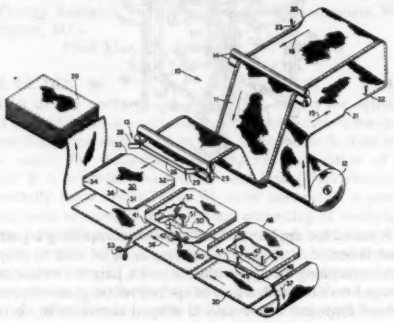
3,955,515

FOLDING AND HEMMING METHOD AND APPARATUS

Norman E. Elsas, Atlanta, Ga., assignor to Nemo Industries, Inc., Atlanta, Ga.

Filed Oct. 7, 1974, Ser. No. 512,468
Int. Cl.² D05B *21/00*
U.S. Cl. 112—121.15 **18 Claims**

15. Apparatus for forming folded hems in lengths of material comprising means for moving a web of material along its length from a supply toward a cutting station, means for folding over and sewing through at least one side edge portion of the web of material as the web of material is moved along its length toward the cutting station, means for cutting across the length of the web of material with a V-shaped cut at the side edge portions to form angled corners in the cut lengths of material, means for moving the cut lengths of material in sequence separately along a path with the cut ends of the lengths of material extending along the path, means for paying out and connecting a continuous thread to the cut lengths of material whereby the thread extends between adjacent ones of the cut lengths of material adjacent the cut ends of the lengths of material as the cut lengths of material move in sequence



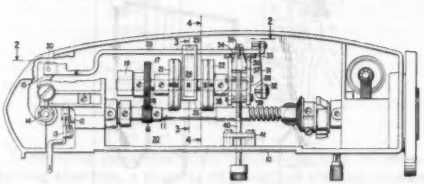
along the path, means for folding over the cut ends of the lengths of material onto the lengths of material as the cut lengths of material move in sequence along the path, means for continuously sewing through the folds as the cut lengths of material move in sequence along the path, and means for cutting the continuous thread between adjacent cut lengths of material.

3,955,516

MAGNETIC ACTUATED SEWING MACHINE ZIGZAG MECHANISM

John A. Herr, Garwood, and Wolfgang Jaffe, Roselle Park, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Feb. 6, 1975, Ser. No. 547,687
Int. Cl.² D05B *3/02, 55/14*
U.S. Cl. 112—158 R **5 Claims**



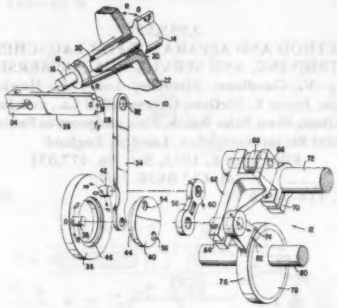
1. A needle bar gate vibrating mechanism for a sewing machine having a frame, a needle bar gate pivotally supported on said frame, a needle bar journaled in said needle bar gate, a main shaft journaled in said frame and operatively connected to actuate said needle bar, and a second shaft journaled in said frame and actuated at a speed less than the frequency of vibration of said needle bar gate, said mechanism including a pair of magnets mounted on said second shaft to rotate therewith and disposed in space relation with their attracting poles arranged opposite each other, shiftable magnet means located between said pair of magnets so as to be influenced by the reversing flux path of said rotating magnets, a driving connection operatively associated with said needle bar gate, and means for operatively connecting said shiftable magnet to said driving connection.

3,955,517

DRAG LINK-TYPE FEEDING MECHANISM

Reinhold Papajewski, Buchig, Germany, assignor to The Singer Company, New York, N.Y.

Filed Sept. 18, 1975, Ser. No. 614,442
Int. Cl.² D05B 27/22
U.S. Cl. 112—210 5 Claims



1. In a feeding mechanism for sewing machines having a stitch length controlling device which includes means for determining different stitch lengths and the direction of feeding of the work fabric in the sewing machine including means for reversing the direction of the feeding of the work fabrics,

a work feeding mechanism comprising a feed dog and means for actuating said feed dog including a rock shaft and a rocker arm for rocking said rock shaft,

an arm pivotally connected to said rocker arm,

a main drive shaft,

a connecting rod operatively connected to said main drive shaft,

pivotal connecting means connecting said connecting rod to said arm, whereby rotation of main drive shaft oscillates said pivotal connecting means to thereby rock said rock arm and said rock shaft,

means for changing the position of said pivotal connecting means thereby controlling the amount of rocking movement of said rock shaft,

said last mentioned means including a stitch length control element operatively connected to said stitch length controlling device with pivot means thereon,

an anchor means fixedly attached to the web of the sewing machine and supporting said stitch length control element in rotatable relationship, and

linking means attached at one end to the pivot means on said stitch length control element and connected at its other end to said first mentioned pivotal connecting means.

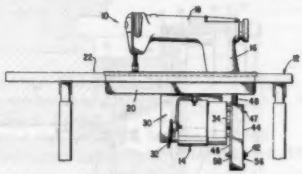
3,955,518

BELT TENSIONING MECHANISM FOR TILTABLE SEWING MACHINES

Santi Riccardo Giocolano, Staten Island, N.Y., assignor to The Singer Company, New York, N.Y.

Filed Aug. 11, 1975, Ser. No. 603,571
Int. Cl.² D05B 75/02
U.S. Cl. 112—217.1 3 Claims

1. The combination of a sewing machine and a work table comprising, a work table, a sewing machine including a frame supported in said work table for movement between a sewing position wherein the work surface of the machine is substantially parallel to the table surface and a tilted position wherein the work surface of the machine is tilted away from the table surface, a drive motor supported remote from the machine, an idler pulley supported between said drive motor and said machine for operably connecting said drive motor to said machine for driving the sewing elements of said machine, a first belt operably connecting said drive motor to said idler pulley, a second belt operably connecting said idler pulley to said machine, and said idler pulley being supported for movement in a fixed path relative to said drive motor and said



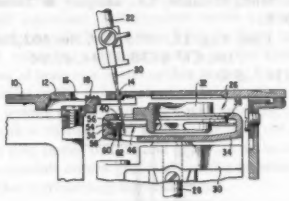
machine with said fixed path being such that during tilting of said sewing machine the movement of said idler pulley will be such that the effective distance between said idler pulley and said drive motor and said sewing machine will decrease whereby the tension on said first and second belts will be relieved.

3,955,519

NEEDLE GUARD FOR SEWING MACHINE

William Weisz, Rockaway, N.J., assignor to The Singer Company, New York, N.Y.

Filed June 2, 1975, Ser. No. 583,148
Int. Cl.² D05B 57/14
U.S. Cl. 112—228 7 Claims



1. A needle guard for a sewing machine loop taker, said loop taker including a cup-shaped body formed by a bottom wall, a vertical side wall extending from said bottom wall and an annular wall extending laterally from the periphery of said side wall, a loop seizing beak formed in said annular wall, and a substantially annular open-ended needle guard disposed within said cup-shaped side body and having one leg thereof disposed adjacent said loop seizing beak for deflecting a needle away from said loop seizing beak and toward the center of the loop taker body.

3,955,520

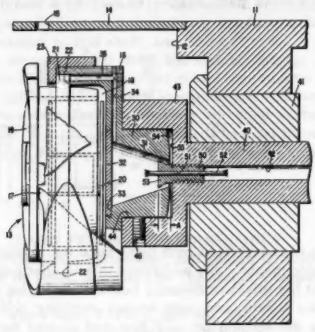
SEWING MACHINE LOOP TAKER MOUNTING

Adolph Armor Gebhardt, Chatham, N.J., assignor to The Singer Company, New York, N.Y.

Filed July 22, 1975, Ser. No. 598,513
Int. Cl.² D05B 71/02
U.S. Cl. 112—256 7 Claims

1. In combination with a sewing machine loop taker having a body portion formed with a bobbin case accommodating raceway, a hub, and lubricant conduits leading from said hub to said raceway, and a drive shaft for said loop taker having a lubricant conducting bore, mounting means for securing said loop taker on said drive shaft comprising: a socket formed at one extremity of said drive shaft communicating with said lubricant conducting bore and snugly accommodating said loop taker hub, fastening means carried by said drive shaft for securing said loop taker hub in said drive shaft socket, said loop taker hub being formed with a lengthwise bore extending

from the free extremity of the hub toward said body portion and into communication with said lubricant conduits, means on said hub bore for encouraging lubricant flow along said hub



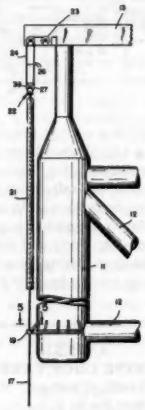
bore toward said lubricant conduits, and means carried by said drive shaft for providing a metered flow of lubricant from said drive shaft lubricant conducting bore to a point intermediate the length of said hub bore.

3,955,521

TENSION LEG PLATFORM WITH QUICK RELEASE MECHANISM

George E. Mott, Metairie, La., assignor to Texaco Inc., New York, N.Y.

Filed Aug. 11, 1975, Ser. No. 603,568
Int. Cl.² B63B *35/44, 21/26*
U.S. Cl. 114—.5 D **12 Claims**



1. Mooring system for an offshore tension leg structure including:

a semisubmersible vessel (**10**) having at least one controlled buoyancy member (**11**), and having means in the latter for altering said vessel's buoyancy whereby to regulate the vessel's floating disposition in a body of water;

elongated hold-down anchoring means (**17**) attachable to said vessel (**10**) for drawing the latter into said water against its upward buoyant force, when tension is applied to said hold-down anchoring means;

tensioning means (**24**) on said vessel positioned to engage said hold-down anchoring means (**17**) and being operable to vary the tension on the latter to affect lowering of the vessel; and

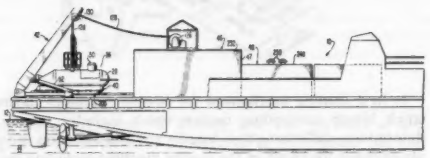
self-disengaging coupling means (**22**) detachably connecting said elongated hold-down anchoring means (**17**) with said tensioning means (**24**) and being operable to automatically become disengaged when tension on said hold-down anchoring means (**17**) is relieved.

3,955,522

METHOD AND APPARATUS FOR LAUNCHING, RETRIEVING, AND SERVICING A SUBMERSIBLE

Anthony V. Gaudiano, Metairie; Larry E. Hawks, Belle Chasse; James E. McDole, Gretna, all of La., and Joseph W. Shanahan, West Palm Beach, Fla., assignors to Peninsular & Oriental Steam Navigation, London, England

Filed June 6, 1974, Ser. No. 477,031
Int. Cl.² B63B *35/40*
U.S. Cl. 114—43.5 VC **30 Claims**



7. An apparatus for launching a submersible into a body of water from the deck of a mother vessel and for retrieving and repositioning the submersible upon the deck of the mother vessel, said apparatus comprising:

a first frame member including first and second coplanar legs each pivotally mounted at one end thereof in a position generally adjacent a peripheral portion of the deck of the mother vessel, said first and second legs being rigidly connected at the other free ends thereof and pivotable in unison to a posture wherein said free ends extend over the deck of the mother vessel or to a posture wherein said free ends extend over the surface of the body of water;

power means connected between said first frame member and the deck of the mother vessel for selectively pivoting said first frame member to a posture wherein said free ends of said legs extend over the deck of the mother vessel or to a posture wherein said free ends of said legs extend over the surface of the body of water;

a second frame member pivotally connected at one end thereof to the free end of said first frame member;

a platform operably positioned adjacent the other end of said second frame member;

power means operably connected between said platform and said second frame member for selectively vertically moving said platform relative to said second frame member;

a winch connected to said floating vessel;

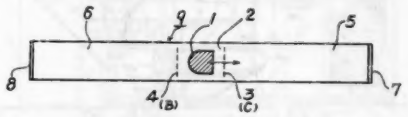
a sheave connected to said free end of said first frame member; and

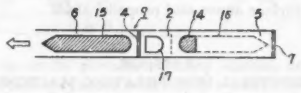
a flexible connector wound at one end upon said winch, passing over said sheave, and extending downwardly through said platform for selective connection to the submersible, the submersible being movable by said flexible connector into engagement with said platform to securely mate the platform to the submersible, said first frame member being then operable to lift and swing the submersible from the deck of the mother vessel or the surface of the body of water with the submersible suspended from said second frame member.

3,955,523
METHOD OF CONTINUOUSLY BUILDING SHIPS

Takaaki Kawakami, Hisai, Japan, assignor to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 4, 1975, Ser. No. 555,224
Claims priority, application Japan, Mar. 20, 1974, 49-30989
Int. Cl.² B63B 9/06
U.S. Cl. 114—65 R 3 Claims





1. A method of building ships, employing an open-ends type dock equipped with first and second removable partition gates to close off the ends of the dock, and third and fourth partition gates which can be installed at positions intermediate the ends of the dock so as to define a first building area between the first partition gate and the installment position of the third partition gate, a second building area between the second partition gate and the installment position of the fourth partition gate, and a middle building area between the installment positions of the third and fourth partition gates, the method comprising the following steps:-

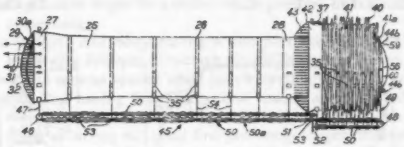
a. constructing the stern portion of a first ship in said middle building area;
b. moving the first ship's constructed stern portion into the first building area, the first partition gate being in its installment position;
c. continuing the construction of the first ship in the first building area by constructing a middle body and a stem body extending from the first ship's stern portion;
d. constructing the stern portion of a second ship in the middle building area;
e. moving the second ship's constructed stern portion into the second building area, the second partition gate being in its installment position;
f. continuing the construction of the second ship in the second building area by constructing a middle body and a stem body extending from the second ship's stern portion;
g. constructing the stern portion of a third ship in the middle building area;
h. installing the third partition gate in its installment position to isolate the middle building area from the first building area, removing the first partition gate from its installment position, floating the first ship out of the first building area, installing the first partition gate in its installment position, draining water from the first building area, removing the third partition gate from its installment position, and moving the third ship's constructed stern portion into the first building area, step (h) being commenced during step (d), (e), (f) or (g);
i. constructing the stern portion of a fourth ship in the middle building area;
j. installing the fourth partition gate in its installment position to isolate the middle building area from the second building area, removing the second partition gate from its installment position, floating the second ship out of the second building area, installing the second partition gate in its installment position, draining water from the second building area, removing the fourth partition gate from its installment position, and moving the fourth ship's constructed stern portion into the second building area, step (j) being commenced during step (g), (h) or (i),

and so on, whereby the middle building area can be kept always essentially free of water by virtue of its being always isolated from the two ends of the dock when said ends are open.

3,955,524
TOWABLE FLEXIBLE MARINE TRAILER

Charles Simon Renoux, Chemin-des-Bellons, Les Bellons, 13190 - Allauch, France

Filed Oct. 16, 1974, Ser. No. 515,345
Claims priority, application United Kingdom, Oct. 19, 1973, 48891/73
Int. Cl.² B63B 25/14
U.S. Cl. 114—74 T 15 Claims

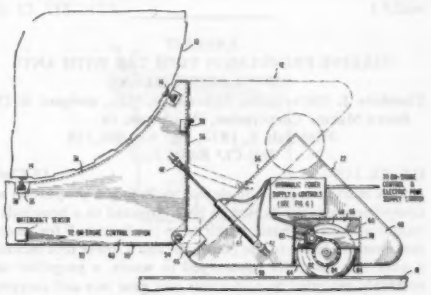


1. A towable flexible marine trailer comprising an elongate container made of flexible material, and flexible walled conduit means externally of the container secured to and extending along said container; said conduit means having: a transverse cross section which decreases from the front towards the rear of said container, an open end near the front of said container and at least one outlet orifice remote from said open end and located in the rear portion of said conduit means so that, during towing of the trailer in liquid medium, said liquid medium can flow through said conduit means from said open end towards said outlet orifice and generate an internal pressure in said conduit means greater than the external pressure exerted by the surrounding liquid medium.

3,955,525
WATERCRAFT DOCKING MECHANISM AND METHOD

Donald S. Seiford, Sr., Inver Grove Heights, Minn., assignor to Twin City Shipyard, Inc., St. Paul, Minn.

Filed Mar. 13, 1973, Ser. No. 340,666
Int. Cl.² B63B 21/56
U.S. Cl. 114—235 R 9 Claims



1. A docking mechanism for use in controlling the direction of travel of water-borne vessels, comprising:

a. a unitary support structure including means for mounting said support structure to a mooring pile;
b. unitary drive supporting means having drive means mounted thereto;

c. means mounting said drive supporting means directly to said support structure so that said drive supporting means can be pivotably moved as a unit relative to said support structure and in a plane substantially parallel to the water line defined by the top surface of the water; and

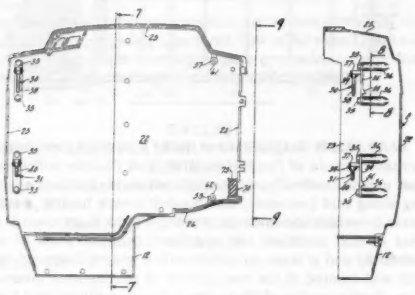
d. means connected to at least said drive supporting means for pivotably moving said drive supporting means as a unit relative to said support structure and in said plane, said movement including advancing said drive supporting means toward a vessel for engagement of said drive means with the side of the vessel for driving the vessel and controlling its direction of travel, and retracting said drive supporting means from the vessel, as desired.

3,955,526

COWL APPARATUS FOR OUTBOARD MOTORS

David W. Kusche, Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Sept. 6, 1975, Ser. No. 503,746
Int. Cl.² B63H *21/26*
U.S. Cl. 115—17 **29 Claims**



26. An outboard motor cowl assembly comprising a cowl member having a sidewall with inwardly extended front and rear walls, a pair of vertically spaced rear hinge means fixedly secured to said back wall and each including an upper support extending parallel to the back wall and a vertically depending fixed pin secured to the support and extending downwardly therefrom, and a pair of vertically spaced front pin means fixedly secured to the front wall and each including a horizontally inwardly extending fixed pin located rearwardly of the front wall.

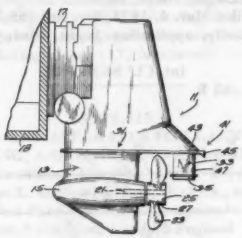
3,955,527

MARINE PROPULSION TRIM TAB WITH ANTI VENTILATION MEANS

Theodore J. Holtermann, Milwaukee, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed July 8, 1974, Ser. No. 486,318
Int. Cl.² B63H *1/28*
U.S. Cl. 115—35 **10 Claims**

1. A marine propulsion device including a propulsion unit comprising means adapted to be connected to a boat hull for mounting said propulsion unit from the boat hull for steering movement relative to the boat hull, and a lower unit including a gear box normally submerged in water, a propeller shaft rotatably mounted by said lower unit gear box and carrying a propeller, a laterally extending anti-cavitation plate extending above said propeller and including a trailing portion, a trim tab extending downwardly from said trailing portion of said anti-cavitation plate aft of said propeller, and deflector means fixedly located aft of said propeller and solely extending downwardly from said trailing portion of said anti-cavitation plate and rearwardly of said trim tab for pressurizing the water forwardly thereof and below said anti-cavitation plate and in the region of said trim tab during forward movement of said



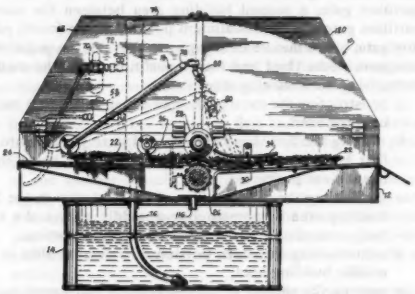
gear box through the water, said deflector means having a lowermost surface above said propeller shaft.

3,955,528

INDUSTRIAL MOP-TREATING MACHINE

Joseph W. Bounds; Lynn E. Goldstein, and Franklin E. Willard, all of Dallas, Tex., assignors to Texel Industries, Inc., Cleburne, Tex.

Filed Mar. 28, 1975, Ser. No. 562,963
Int. Cl.² B05C *11/00*
U.S. Cl. 118—2 **5 Claims**



1. An industrial mop-treating machine, comprising:

a. a drum adapted to store mop-treating liquid,

b. said drum having an outlet and an inlet for said mop-treating liquid,

c. a frame adapted to be removably mounted on said drum of mop-treating liquid,

d. conveying means mounted on said frame for conveying a mop along said frame,

e. a trough mounted on said frame below said conveying means,

f. a drain providing communication between said trough and the inlet of said drum,

g. pump means for removing mop-treating liquid from said drum through the drum outlet,

h. spray means for spraying said removed mop-treating liquid upon said mop at a spray station, and

i. actuating means for activating said spray means when the mop enters the spray station and de-activating said spray means when the mop leaves the spray station,

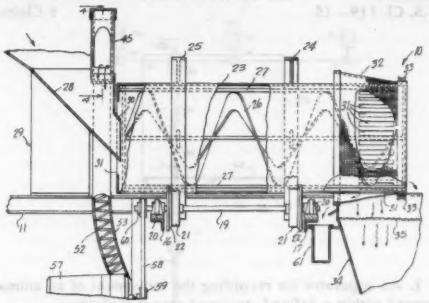
j. whereby excess mop-treating liquid sprayed upon the mop drains into the trough and thence through the drain and drum inlet into the drum for removal by the pump means and for spraying by said spray means upon a subsequently conveyed mop.

3,955,529

AUTOMATIC BREADING MACHINE

Buckley R. Reed, Jeffersontown, Ky., assignor to Reed & Associates, Inc., Jeffersontown, Ky.

Filed Aug. 22, 1974, Ser. No. 499,496
Int. Cl.[2] A23G 3/26
U.S. Cl. 118—19 6 Claims



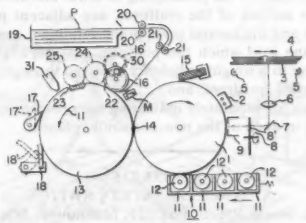
1. An automatic portable breading machine comprising a table, a breading cylinder horizontally mounted for horizontal rotation on said table, means on said table for rotating said breading cylinder, an inlet chute on said table positioned adjacent one end of said breading cylinder for feeding food stuff to be breaded and breading flour into said breading cylinder, an elongate mixing blade extending along the inside length of the cylinder for moving the food stuff and breading flour through the cylinder, means underlying the discharge end portion of said breading cylinder for separating the breading flour and food stuff, and a plurality of flexible housings and a flexible screw conveyor mounted in each housing with said housings detachably secured to said inlet chute and the means separating the food stuff and the breading flour.

3,955,530

TRANSFER-FIXING DEVICE

Wilhelm Knechtel, Biebertal, Germany, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed June 26, 1974, Ser. No. 483,405
Claims priority, application Japan, June 28, 1973, 48-73201
Int. Cl.[2] G03G 15/16, 15/20, 15/22
U.S. Cl. 118—60 9 Claims



1. A transfer-fixing device for transferring a developed image onto a transfer medium, said device comprising:

an image carrier having a surface for carrying a developed image, said image carrier having a metallic base, an elastic layer of heat insulating material covering said metallic base and a heat-resistant layer covering said elastic layer and forming said surface;

means for urging the transfer medium against said surface of said image carrier; and

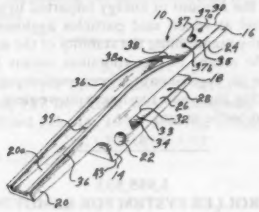
means for heating said urging means so that the transfer medium is in a heated condition at the time it is urged against said image carrier.

3,955,531

PRESSURE FINGER FOR DOCTOR BLADE ASSEMBLY

Jack Frederick Brown, Pierrefonds, Canada, assignor to James Ross Limited, Lachine, Canada

Filed Nov. 26, 1974, Ser. No. 527,346
Int. Cl.[2] B05C 11/04
U.S. Cl. 118—261 6 Claims



1. A pressure finger for a doctor blade pressure plate assembly, comprising,

an integral cast body having a hub part provided with a transverse fulcrum to receive pivotal mounting means,

first and second spaced apart jaws extending from the hub part and having first and second spaced apart inwardly facing opposed inner surfaces defining therebetween a blade-receiving slot, said first jaw being longer than said second jaw and having an outer surface opposed to said first surface,

a tongue extending from the hub part in a direction opposite to that of the jaws forming a continuation of the first jaw and having a bearing surface facing the same direction as said outer surface, said bearing surface and said outer surface forming a continuous outer side extending from said first jaw to the hub part and through the tongue,

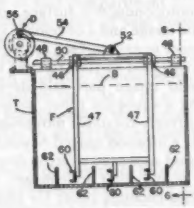
said outer side including at least one continuous elongated symmetrically located flange extending outwardly therefrom to stiffen the first jaw against deflection from the second jaw.

3,955,532

AGITATION OF AN ACIDIC AQUEOUS COATING COMPOSITION CONTAINING DISPERSED PARTICLES OF AN ORGANIC COATING-FORMING MATERIAL

Wilbur S. Hall, Plymouth Meeting; Harry M. Leister, and Raymond J. Robinson, both of Ambler, all of Pa., assignors to Amchem Products, Inc., Ambler, Pa.

Filed Sept. 10, 1973, Ser. No. 395,960
Int. Cl.[2] B05C 11/11
U.S. Cl. 118—612 1 Claim



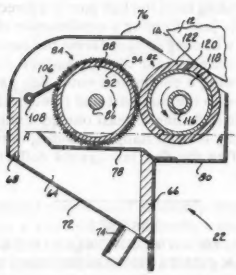
1. Apparatus for coating metallic surfaces comprising an acidic aqueous coating composition comprising dispersed particles of an organic coating-forming material which is effective in forming an organic coating on a metallic surface immersed in the composition, container means for holding said composition, agitating means positioned in a region of

said container means below the level of said composition for periodically impelling portions of said composition to other regions of the container means, said agitating means comprising at least one movable vane, drive means for moving said vane, the surface area of the vane and the driving speed of said drive means being such that the amount of shear stress imposed on the composition by the agitating means is maintained below a level at which said particles are caused to agglomerate and such that the amount of energy imparted to said particles is below a level at which said particles agglomerate due to collision thereby maintaining the stability of the agitated composition, baffle means in the container means for coacting with the vane to impel coating composition upwardly, and means mounting the vane for linear movement toward and away from the baffle means.

3,955,533
SQUEEGEE ROLLER SYSTEM FOR REMOVING EXCESS DEVELOPER LIQUID FROM PHOTOCONDUCTIVE SURFACES

Ian E. Smith, Lockleys, and Dennis I. Scroggs, Para Hills, both of Australia

Continuation of Ser. No. 292,625, Sept. 27, 1972, abandoned. This application Sept. 3, 1974, Ser. No. 502,815
Int. Cl.² G03G *15/10*
U.S. Cl. 118—637 **5 Claims**

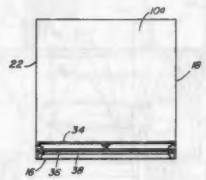


1. In an electrostatic copying machine having a member provided with a photoconductive surface adapted to receive a latent electrostatic image and a developer system adapted to apply liquid developer to said surface at a developing location and means for moving said surface relative to said developer system to carry said image past said developing location, apparatus including a squeegee roller, means mounting said squeegee roller for freely rotatable movement in engagement with said surface at a location spaced beyond said developing location whereby said squeegee roller is driven by said member independently of any other drive means, a cleaning roller, means mounting said cleaning roller for rotary movement in operative relationship with the surface of said squeegee roller, a receptacle for receiving liquid removed from said surface by said squeegee roller, means for retaining removed liquid in said receptacle to a certain level, said roller mounting means mounting said rollers in said receptacle with portions of the rollers immersed in said retained liquid and means for driving said cleaning roller in a direction opposite to and at a speed slightly greater than the direction and speed at which said squeegee roller is driven by said surface.

3,955,534
LABORATORY ANIMAL ACTIVITY GAME

Robert J. Boudrot, Falmouth; Harry G. Olsen, Woburn, and Frederick Halbich, Burlington, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Mar. 7, 1975, Ser. No. 556,511
Int. Cl.² A01K *29/00*
U.S. Cl. 119—15 **5 Claims**



1. An apparatus for recording the movement of an animal housed within a defined, enclosed area including:

a. a cage having a size adequate to house the animal for extended time intervals and to allow the animal to move in any direction in a horizontal plane,

b. a platform in the shape of a parallelogram located generally at the bottom of the cage and being positioned in a horizontal plane, the platform having a surface area substantially conforming to the horizontal surface area of the cage,

c. means below the center of gravity of the platform for balancing the platform in the horizontal plane in response to a net force acting on the platform which is directed through the center of gravity of the platform,

d. means for defining a predetermined, fixed plurality of non-horizontal planes into which the platform may be aligned, the planes corresponding to a plurality of defined regions on the platform through which the force is directed, the platform adapted to align itself into one of the planes in response to a net force on the platform directed other than through the center of gravity of the platform, the multiple plane defining means including a horizontal support platform located below the platform, the central pivot point being affixed to the support platform, and four upstanding posts affixed to the support platform below the midpoints of the four side edges of the platform, the upper ends of the posts being of lower elevation than the lower surface of the platform, any adjacent pair of the posts and the central pivot point defining a quadrant and a plane into which the platform may be aligned in response to a weight imbalance directed through the corresponding quadrant, and

e. means for separately indicating the presence of the platform in each of the non-horizontal planes.

3,955,535
AUTOMATIC SAFETY SWITCH

Erwald E. Stock, Rte. 3, Box 121, Manitowoc, Wis. 54220

Filed Jan. 20, 1975, Ser. No. 542,417
Int. Cl.² A01K *29/00*
U.S. Cl. 119—27 **11 Claims**

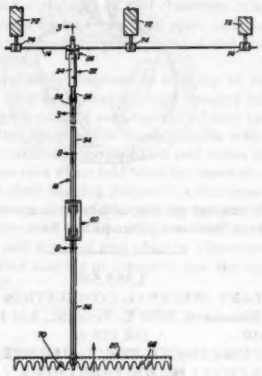
1. A safety switch for use with cow trainer, the switch comprising, in combination:

a. a frame;

b. clamp means mounted on the frame for engaging an electrically conductive wire; and

c. contact means slidably mounted on the frame for movement toward and away from the clamp means and connectible to a device to be energized for being normally pulled away from the clamp means by the device and breaking contact between the contact means and the clamp means; and the frame is a sleeve constructed from

an electrically insulating material, the clamp means and contact means being constructed from an electrically conducting material; and the contact means including a longitudinally extending contact element arranged within



the sleeve, the contact element being provided with a longitudinal slot, and a pin disposed extending into the sleeve transversely thereof and engaging in the slot for permitting limited movement of the contact element relative to the sleeve.

3,955,536

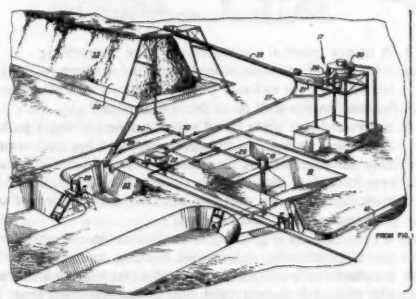
APPARATUS FOR CONVERTING THE RESIDUAL NUTRITIVE CONTENT OF ANIMAL WASTE INTO NUTRITIOUS AND PALATABLE FEED SUPPLEMENT FOR REFEEDING TO LIVESTOCK

Richard E. Bunger, 5202 E. Washington St., Phoenix, Ariz. 85034

Division of Ser. No. 406,347, Oct. 15, 1973, abandoned. This application Mar. 10, 1975, Ser. No. 557,051

Int. Cl.² A01K *1/00*

U.S. Cl. 119—28 **5 Claims**



1. Apparatus for collecting the processing animal waste comprising:

a pen for containing livestock having a slotted floor,

a trough arranged below said floor for receiving animal waste dropped therein by the animals housed in said pen,

scraper means for periodically removing the animal waste from said trough to a holding tank in time periods of less than 24 hours,

a holding tank for diluting the waste,

separating means for removing the solids from the liquids of the diluted waste received from said holding tank,

press means for receiving and compressing the solids from said separating means,

drying means for receiving the solids from said press means for moisture reduction and pasteurization thereof, and

means for processing the liquids received from said separating means.

3,955,537

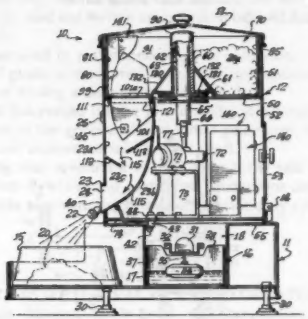
FEEDER WITH TIMED BATCH MIXING SYSTEM

Toshio Yujiri, 717 De Palma Way, Montebello, Calif. 90640

Filed Feb. 18, 1975, Ser. No. 550,818

Int. Cl.² A01K *5/02*

U.S. Cl. 119—51.13 **5 Claims**



4. A feeder for the fresh preparation in an animal feeding dish of a batch mixture of a solid component and a liquid component, at predetermined feeding periods, which feeder comprises:

a substantially cylindrical housing, open at the top, including a horizontal intermediate wall dividing the interior of said housing into an upper hopper compartment and a lower motor compartment;

a removable cover for said top opening of said housing:

a feeding dish located adjacent said housing at an elevation below said intermediate wall;

a vertically disposed drive shaft rotatably mounted in said intermediate wall;

a hopper rotor releasably received into driving engagement on the upper end of said drive shaft, in said hopper compartment, said hopper rotor having radial walls defining a plurality of sectorial hoppers;

a motor means in said compartment coupled to said drive shaft for rotational drive of said hopper rotor in an advancing direction;

a plurality of flap bottoms, one for each of said sectorial hoppers, each said flap bottom being hinged to one of said radial walls on the side of its corresponding hopper, which is the leading side of said hopper when said hooper rotor is rotated in an advancing direction during operation;

a chute for delivery of a batch of food solids from its corresponding hopper to said feeding dish, said chute including a chute opening under said hopper rotor, to mate successively with the flap bottoms of each of said hoppers, in turn, as said hopper rotor is rotated in said advancing direction by said motor;

a liquid component delivery system including a line from a liquid component supply, a nozzle discharging from said line into said food dish, and a valve in said liquid component line; and

timer system for actuating said motor at each feeding period to drive said hopper rotor sufficiently to place

each of said hoppers successively in alignment with said chute, and comprising means for actuating said timer valve in said liquid component line for a time sufficient to deliver one batch portion of said liquid component.

3,955,538

FUEL REFORMING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

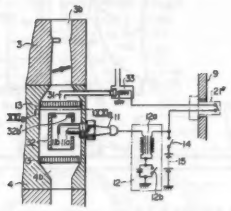
Masaaki Noguchi, Nagoya; Masaharu Sumiyoshi, Toyota; Yukiyasu Tanaka, Okazaki, and Taro Tanaka, Chiryu, all of Japan, assignors to Nippon Soken, Inc., Japan

Filed July 11, 1974, Ser. No. 487,785

Claims priority, application Japan, July 26, 1973, 48-84345; July 26, 1973, 48-84348; Nov. 15, 1973, 48-128617; Nov. 19, 1973, 48-129988; Nov. 20, 1973, 48-130904; Mar. 12, 1974, 49-28876

Int. Cl.² F02B *43/08*

U.S. Cl. 123—3 **9 Claims**



1. A fuel reforming system for an internal combustion engine operable with a hydrocarbon fuel comprising: a passage for a rich mixture of air and the fuel, at least a single spark plug disposed in said passage, means for supplying said spark plug with a high voltage for producing a spark discharge, a secondary air intake pipe having an open end disposed in said passage upstream of said spark plug for supplying secondary air to said passage, means for sensing the temperature of the engine, and means connected to said sensing means for controlling the combustion of said rich mixture in accordance with the temperature of the engine, whereby a part of said rich mixture is imperfectly burned to reform and vaporize the fuel contained in said rich mixture in accordance with the temperature of the engine.

3,955,539

ROTARY PISTON INTERNAL COMBUSTION ENGINE

Hans O. Scherenberg, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

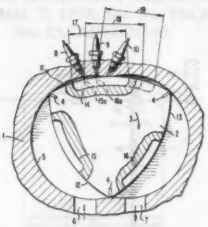
Filed Dec. 6, 1974, Ser. No. 530,271

Claims priority, application Germany, Dec. 8, 1973, 2361214

Int. Cl.² F02B *53/12*

U.S. Cl. 123—8.09 **11 Claims**

1. A rotary piston internal combustion engine with a polygonal piston means with a multi-arched housing casing means, in which the piston means is provided in its piston flanks with combustion space recess means into which takes place the ignition, characterized in that the combustion space recess means provided in a piston flank is arranged circumferentially



offset with respect to the combustion space recess means provided in at least one other piston flank.

3,955,540

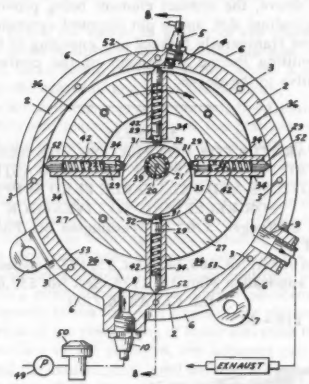
ROTARY INTERNAL COMBUSTION ENGINE

James G. Blanchard, 3500 E. Texas St., Lot 17, Bossier City, La. 71010

Filed May 22, 1974, Ser. No. 472,500

Int. Cl.² F02B *55/14*

U.S. Cl. 123—8.45 **1 Claim**



1. A rotary internal combustion engine comprising:

a. a housing fitted with at least one fuel ignition means, an intake port, an exhaust port, and a cylindrically shaped housing inside wall of uniform diameter;

b. a forward end plate fitted with an external water jacket, a bushing, carrying a forward end plate lip, and removably mounted on the forward end of said housing, and a rear end plate fitted with an external water jacket and a concentric groove, and mounted on the rear end of said housing to close said housing;

c. a cylindrically shaped rotor positioned in eccentric rotational relationship inside said housing, said rotor having a cylindrically shaped cavity and a plurality of slots radially disposed therein, said slots communicating from the outer periphery of said rotor to said cavity, the rear circumferential edge of said rotor being in registration with said concentric groove in said rear end plate;

d. a rotor cap plate carried by said rotor closing one end of said rotor and cooperating with said forward end plate and said forward end plate lip to seal said forward end plate;

e. a cylindrically shaped vane race housing an oil reservoir and carried by said rear end plate and positioned in ec-

centric registration with said cylindrically shaped cavity in said rotor;

f. a plurality of vanes each having a slot at the top thereof and a pair of cavities therein and slidably disposed in said slots, and adapted to traverse said vane race and said housing inside wall when said rotor is caused to rotate within said housing, said vanes, said forward end plate, said rear end plate, said rotor, and said housing inside wall defining a plurality of fuel chambers in said engine;

g. a shaft carried by said rotor cap plate and journaled for rotation in said bushing in said forward end plate and said rear and plate;

h. a vane tip slidably disposed in said top of each of said vanes and adapted to traverse said housing inside wall;

i. vane springs in each of said cavities of said vanes to bias said vane tips against said housing inside wall;

j. vane rollers rotatably mounted on said vanes and traversing said vane race when said rotor is caused to rotate; and

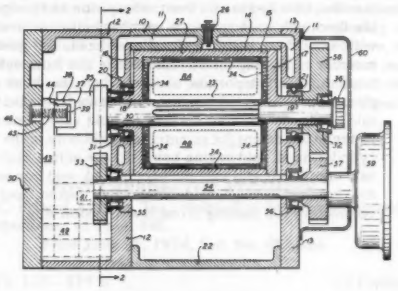
k. a rear end plate bearing disposed in the upper center of said vane race and rotatably carrying one end of said shaft and a forward end plate bearing mounted on the outside surface of said forward end plate in alignment with said rear end plate bearing to rotatably seat the opposite end of said shaft.

3,955,541

ROTARY INTERNAL COMBUSTION ENGINE WITH UNIFORMLY ROTATING PISTONS COOPERATING WITH REACTION ELEMENTS HAVING A VARYING SPEED OF ROTATION

Frederick W. Seybold, 1979 Dogwood Drive, Scotch Plains, N.J. 07076

Filed Apr. 15, 1974, Ser. No. 461,167
Int. Cl.² F02B *53/00*
U.S. Cl. 123—8.47 **3 Claims**



1. A rotary internal combustion engine comprising in combination:

a. a housing having a circular bore, exhaust and intake ports and ignition means,

b. two side frames supporting said housing,

c. a hollow cylindrical rotor with side walls, axial-helical slots and two diametrically opposed, sector-shaped pistons integral with said rotor and adjacent said slots,

d. said side walls having long hubs suitable for mounting ball bearings, a first ball bearing being provided with a snap ring and mounted on one of said side walls, said snap ring bearing against one of the side frames, a second ball bearing mounted on the other hub and having its outer race movably fitted in the other side frame,

e. a multiple-splined shaft journalled in said long hubs, said shaft having a shoulder to abut the cone of a first flanged tapered roller bearing and its cup being mounted in said other side frame,

f. a large spur gear secured to one of said long hubs, and a second flanged tapered roller bearing, its cup being mounted in said spur gear and its cone being supported on said shaft, the cones of said roller bearings facing oppositely,

g. a reactor having two diametrically opposed, sector-shaped elements integral therewith and mounted on said multiple-splined shaft,

h. a second shaft mounted on bearings supported by said side frames,

i. first and second pinions of equal size being secured at opposite ends to said second shaft, said first pinion meshing with said large gear,

j. a third pinion being one-half the size of said large gear,

k. a stub shaft secured in its adjacent side frame, said third pinion rotating freely thereon and meshing with said second pinion,

l. a pin secured in said third pinion, forming a crank,

m. an end cover attached to one of said side frames to enclose said second and third pinions,

n. a pin supported on said side frame and said end cover,

o. a link pivotted on said pin,

p. a connecting rod being pivotted on said link and on said crank pin, said rod having an extension beyond said crank pin pivot,

q. a pin secured in said connecting rod extension,

r. a radial guide arm secured to said multiple-splined shaft, said arm having a deep groove to receive

s. a block fulcrumed on the pin in said rod extension and slideable in the groove of said radial guide arm, and

t. a flywheel secured to said second shaft,

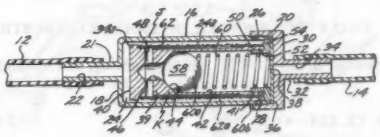
u. whereby one revolution of said rotor turns said second shaft with flywheel and crank two revolutions and turns said guide arm with its connected reactor only one revolution.

3,955,542

WATER INJECTOR VALVE AND REGULATOR

William Dale Skaggs, 1572 Belle, San Bernardino, Calif. 92404

Filed Nov. 8, 1974, Ser. No. 522,029
Int. Cl.² F02D *19/00*
U.S. Cl. 123—25 L **3 Claims**



1. In combination with an internal combustion engine that has a carburetor with an air intake, which carburetor delivers an air-fuel mixture to said engine, a device for supplying water to said air-fuel mixture when said engine is operating to lessen the content of carbon monoxide in the exhaust from said engine, said device including:

a. a vented reservoir for water;

b. first tubular means connected to the interior of said reservoir;

c. a housing assembly that includes an elongate cup that has a first closed end and a second end that is open, a cap that removably closes said second end, said first end and said cap having first and second openings therein, and said first opening connected to said first tubular means;

d. second tubular means connecting said second opening to said air intake of said carburetor;

e. an orifice defining plate removably held in said housing assembly adjacent said cap;

f. spring loaded valve means that occupy a fixed position in said housing and allow water to flow from said first tubular means through said valve means to said orifice only when said air inteke effects a negative pressure in said second tubular means that is so related to the size of said

orifice and the pressure within said housing that said water as it discharges from said orifice is in the form of a high velocity stream of mist containing a plurality of minute globules of water that are converted to water vapor as they flow through said second tubular means to mix with said air-fuel mixture by extracting heat from the latter, said water vapor when entering the zones of combustion in said engine with said air-fuel mixture combining with carbon monoxide and free carbon therein to form carbon dioxide and hydrogen, which hydrogen subsequently combines with oxygen in said air-fuel mixture to form water that repeats the above cycle prior to the products of combustion from said zones being discharged to the ambient atmosphere as exhaust said spring loaded valve means including:

1. an elongate valve body of less transverse cross sectional area than the interior of said cup, said valve body having first and second ends, a first cavity that extends longitudinally into said valve body from said second end thereof to develop into a tapered valve seat that is in communication with a second cavity, said second cavity in communication with a transverse passage defined in said valve body;
2. a ball longitudinally movable in said first cavity; and
3. a compressed helical spring that has a first end in contact with said ball and a second end in contact with said orifice defining plate, said spring maintaining said ball on said seat until said negative pressure in said second tubular means reduces the pressure in said first cavity to the extent that said ball moves from said seat to permit water from said first tubular means to flow through said passage, second cavity, valve seat and first cavity to discharge from said orifice as said stream;

g. first means for removably holding said spring loaded valve means and said orifice defining plate in fixed positions in said housing; and

h. second means for removing solid particles entrained with water from said reservoir, prior to said water flowing through said orifice, which particles are of sufficient size to obstruct said orifice by lodging therein.

3,955,543

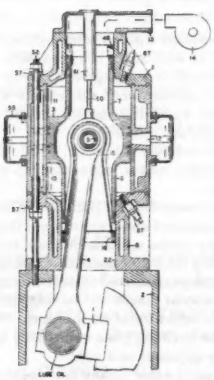
TWO STROKE CYCLE INTERNAL COMBUSTION ENGINE

Arthur E. Brown, 117 E. 5th St., Corning, N.Y. 14830

Filed Feb. 6, 1974, Ser. No. 439,988

Int. Cl.² F02B *75/16*

U.S. Cl. 123—61 R **22 Claims**



1. In a two stroke cycle internal combustion engine, the combination of a crankcase, a crankshaft rotatably mounted in said crankcase, a working cylinder fastened to said crankcase, a front cylinder head and a back cylinder head fastened to said working cylinder, each cylinder head having a reduced diameter bore therein, a double acting working piston reciprocable in said working cylinder, a reduced diameter front valve piston and a reduced diameter back valve piston, said two valve pistons being attached to said working piston so as to form a reciprocating piston assembly, each valve piston being reciprocable in the bore of its respective cylinder head, a connecting rod interconnecting said working piston and said crankshaft, said connecting rod being connected to said working piston by means of an articulative joint, said working cylinder having exhaust ports located in its wall, said working piston being adapted to uncover said exhaust ports near the end of each reciprocative stroke, a scavenge pump for supplying scavenge air, a conduit means interconnecting said scavenge pump and said back cylinder head so as to conduct the scavenge air from the scavenge pump to the interior of said bore in the back cylinder head, said working cylinder having within it an annular front working chamber and an annular back working chamber, said valve pistons being adapted to momentarily withdraw from the bores in their respective cylinder heads near the end of a reciprocative stroke for the purpose of admitting scavenge air into their respective working chambers so as to scavenge the working chambers, each working chamber having a uniflow type scavenging operation wherein the scavenge air enters one axial end of the working chamber and the exhaust gas exits through said exhaust ports at the other axial end of the working chamber, said front valve piston having a ring groove formed in its outer cylindrical surface, a piston ring located in said ring groove, said piston ring being adapted to expand radially outward and seal against the wall of said bore in the front cylinder head,

wherein the improvement comprises; said front valve piston and said piston ring both being adapted to withdraw from said bore in the front cylinder head during part of their reciprocative stroke for the purpose of admitting scavenge air into said front working chamber, a guidance member attached to said front valve piston and reciprocable therewith, said guidance member being reciprocable within said bore in the front cylinder head, said guidance member remaining inside said bore in the front cylinder head during that portion of time when the front valve piston and said piston ring are withdrawn from said bore, said guidance member serving to hold said front valve piston in alignment for re-entry into said bore in the front cylinder head, said engine being double acting and using said crankshaft and said connecting rod, said connecting rod passing through said front valve piston, and said connecting rod passing through said piston ring.

3,955,544

INTERNAL COMBUSTION ENGINE

Walter Franke, Maschen, u. Winsen-Luhe, Germany, assignor to Motoren Forschungs GmbH & Co. KG and Franke Motoren, both of Hamburg, Germany

Division of Ser. No. 3,906,908, Nov. 13, 1972, Pat. No. 3.906,908. This application Apr. 17, 1975, Ser. No. 568,773

Claims priority, application Germany, Nov. 15, 1971, 2156586

Int. Cl.² F02B *75/02*

U.S. Cl. 123—75 RC **6 Claims**

1. An internal combustion engine, which comprises

at least one pair of cylinders, each of which has a head and a bottom,

at least one pair of pistons, each of which is reciprocable in one of said cylinders and defines a power chamber with said head of said cylinder and an air compression chamber with said bottom of said cylinder.

controlled intake and exhaust ports formed in each of said cylinders and adapted to communicate with said power chamber thereof,

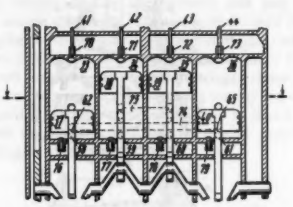
igniting means associated with each of said cylinders and operable to initiate a combustion of a fuel-air mixture in said power chamber of the associated cylinder,

an inlet formed in each of said cylinders and adapted to communicate with said compression chamber thereof,

a valve controlling each of said inlets,

both said pistons of each pair being adapted to perform in unison a forward stroke toward a dead center near side bottom, whereby air is compressed in the compression chamber of the associated cylinder, and a reverse stroke from said dead center near said bottom to a dead center near said head, and

transfer means for transferring compressed air from said compression chambers to said exhaust port of each of



said cylinders after a power stroke of the associated piston,

said transfer means comprising at least one pair of compression chamber outlets arranged to communicate with said compression chambers of both cylinders of each pair at the beginning of each of said reverse strokes of the associated piston, at least one pair of power chamber inlets arranged to communicate with each of said power chambers of both cylinders of each pair at the beginning of each of said reverse strokes of the associated piston, at least one pair of transfer ducts adapted to connect one pair of said outlets to one pair of said inlets, and a cross-connecting duct connecting said transfer ducts of each pair.

3,955,545

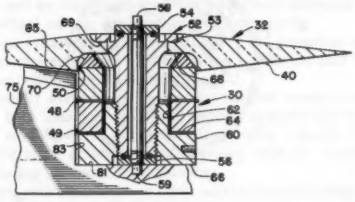
POST CARBURETOR ATOMIZER

Jack C. Priegel, El Paso, Tex., assignor to Autotronic Controls Corporation, El Paso, Tex.

Filed June 25, 1974, Ser. No. 483,056

Int. Cl.² F02M *27/08*

U.S. Cl. 123—119 E **10 Claims**



1. In combination with an internal combustion engine having an intake manifold flow connected to a carburetor, a post carburetor atomizer apparatus interposed between said carburetor and manifold;

said atomizer apparatus comprising a housing having an inlet and an outlet, an exciter, an atomizer plate assembly; means including circuitry connected to said exciter for causing excitation thereof;

said housing comprising upper and lower cavity forming members having said upper and lower separators attached thereto; said separators having adjacent sharp edge portions which are spaced from said plate assembly when said upper and lower portions of said housing are mated so that said atomizer plate assembly is enclosed within said housing such that an annulus is formed about said plate assembly to cause large droplets of fuel to be forced to impinge upon said plate assembly and the droplets subsequently atomized by the vibrating action thereof; said plate assembly being apertured and provided with opposed faces;

a load bolt means having a shoulder formed thereon for engagement with one said face, a locking ring, a load ring, said exciter being compressed between said locking ring and load ring, a marginal circumferentially extending annular area of said plate assembly being compressed between said load ring and said load bolt means;

an annular area formed on one face of said plate assembly, the last said area being smaller in diameter with respect to the annular area contacted by said load ring, each said annular area being concentrically arranged respective to one another and placed in compression by said load bolt means and said load ring;

whereby, said exciter imparts vibration into said locking and load rings to thereby compress the opposed faces of the plate assembly so that the plate assembly vibrates in a flexural mode.

3,955,546

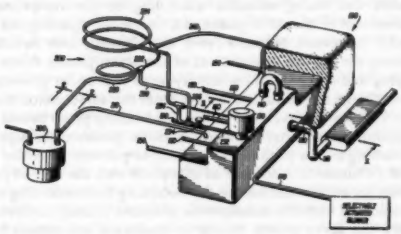
FUEL HEAT GENERATOR FOR INTERNAL COMBUSTION ENGINES

Seth Lee, Jr., Rte. 1, Coats, N.C. 27521

Filed Feb. 4, 1975, Ser. No. 546,868

Int. Cl.² F02M *31/00*

U.S. Cl. 123—122 E **6 Claims**



1. The combination with an internal combustion engine having fuel pump, carburetor input and output means and exhaust manifold, of fuel gasification apparatus comprising:

A. a heat generator, said generator having connection with the exhaust manifold whereby the exhaust manifold may provide heated gases of exhaust to the generator, said heat generator being also interconnected with the fuel pump and carburetor;

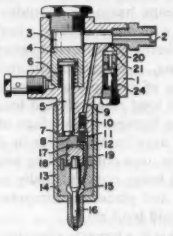
B. a fuel conduit having at least two adjoining sections connecting the fuel pump to the carburetor whereby to supply the carburetor with fuel; and

C. at least two corresponding heat flow conduit sections emanating from the generator and encompassing the respective fuel conduit sections in heat exchange relation thereto, whereby to heat the fuel during its course from the pump to the carburetor, said heat flow and fuel conduits having connection with the carburetor in complemental disposition to each other, whereupon generation of exhaust from the engine the exhaust heat flow passes into said heat flow conduit sections resulting in the liquid fuel being preheated and gasified, and to the carburetor to combine with air in the carburetion mode.

3,955,547
FUEL INJECTION DEVICE FOR INTERNAL COMBUSTION ENGINES

Hachiro Aoki, and Motonobu Sunaga, both of Higashimatsuyama, Japan, assignors to Diesel Kiki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 30, 1974, Ser. No. 519,238
Int. Cl.² F02M *39/00*; F02D *1/04*
U.S. Cl. 123—139 BC **6 Claims**



1. A fuel injection device for internal combustion engines comprising, means for continuously feeding fuel under constant pressure, a distributor-controller comprising a rotor rotatable relatively to speed of the engine and a rotor sleeve with a first port in communication with the fuel feeding means and second ports in communication with fuel injection valves, the fluid fuel under pressure introduced through the first port being, under the influence of the turning rotor, distributed through the second ports to the fuel injection valves one after another and the fuel injection valves comprising a servo piston reciprocable under the fuel pressure and the force of a spring, a plunger having a diameter smaller than that of the servo piston and being movable according to the reciprocating movement of the servo piston and nozzle for injecting the fuel under increased pressure from the plunger, and switching, during the forward movement of the servo piston, from supplying and stopping of the supplying of fuel under pressure to discharging of the fuel returning from the servo piston during the backward movement of the same taking place in one fuel injection valve after another, is made possible through the switching action of the turning rotor to put one of a third port and a channel into and out of alignment with the second ports, when an outlet channel for the returning fuel becoming communicated with the atmospheric pressure through a throttling port, the servo piston during its backward movement being subjected to a back pressure variable according to a throttling of the throttling port to have a varied stroke thereby to control an amount of fuel to injected through the nozzle.

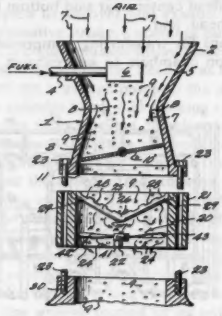
3,955,548
FUEL/AIR MIXING DEVICE FOR INTERNAL COMBUSTION ENGINE CARBURETOR

Charles W. Thomas, Jr., Flatwoods, Ky., assignor to Burgess F. Stewart, Russel and William F. Wilburn, Raceland, both of, Ky.

Filed July 19, 1974, Ser. No. 490,088
Int. Cl.² F02M *29/00*
U.S. Cl. 123—141 **3 Claims**

1. A device for vaporizing fuel into the air of a carbureted air/fuel mixture for an internal combustion engine wherein the carbureted mixture contains air, vaporized fuel and aspirated liquid fuel droplets, comprising:

1. a conduit means for conveying the carbureted mixture from a carburetor to an intake manifold of an internal combustion engine, said conduit means having an upper carburetor side opening and a lower intake manifold side discharge opening;
2. a rotatable turbulence producing means disposed in the said conduit means near the lower opening, said rotatable means being capable of rotation about a vertical axis thereof by passage of the carbureted mixture therethrough and thereby producing turbulence in the mixture;
3. an aspirated liquid fuel droplet collector and vaporizing means disposed in said conduit near said upper opening and above the said rotatable means, said collector and vaporizing means having:
   i. a substantially enclosed central portion disposed axially above the vertical axis of the said rotatable means,

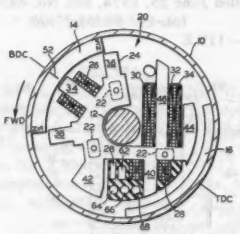


   ii. outer portions disposed above said central portion and slopingly connected to said central portion, said outer portions having openings in at least the uppermost parts thereof for receiving and collecting aspirated liquid fuel droplets, and
   iii. a fuel droplet discharge opening in said central portion and said discharge opening being located in the proximity of the vertical axis of said rotatable means, said proximity being defined by a diameter generated from the axis of the rotatable means which is no more than one-third of the diameter of the rotatable means.

3,955,549
CD IGNITION SYSTEM WITH ANTI-REVERSE FEATURE

Bob O. Burson, East Longmeadow, Mass., assignor to R. E. Phelon Company, Inc., East Longmeadow, Mass.

Filed Oct. 29, 1974, Ser. No. 518,569
Int. Cl.² F02P *1/00*
U.S. Cl. 123—148 CC **11 Claims**



1. In a capacitor-discharge ignition system for a two-stroke internal combustion engine having a crankshaft, a spark plug for ignition and a member rotated in synchronism with the crankshaft and the engine cycle, the combination comprising:

an ignition transformer having a primary coil and a secondary coil for producing a spark voltage for the spark plug;

a capacitor connected for timed discharging through the primary coil of the ignition transformer;

means for charging the capacitor during each engine cycle;

switching means connected between the capacitor and the primary coil of the transformer and activated by trigger

signals to establish an electrical discharge path between the capacitor and the primary coil of the ignition transformer;

triggering means connected with the switching means and including flux-varying means and a trigger coil for producing a first trigger signal from the trigger coil to actuate the switching means and discharge the capacitor through the primary coil in timed relationship with forward rotation of the engine crankshaft to sustain the engine operation, the flux-varying means and the trigger coil being selectively positioned relative to one another in the engine for movement past one another by the rotated member during each rotation of the engine crankshaft to produce the first trigger signal; and

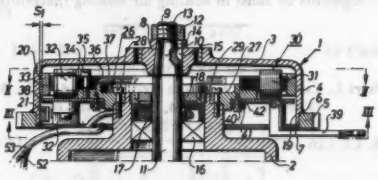
suppressing means connected with the switching means and including the primary coil of the ignition transformer and the flux-varying means, the primary coil and the flux-varying means also being selectively positioned relative to one another in the engine for movement past one another by the rotated member during each rotation of the engine crankshaft for producing a second trigger signal from the primary coil to actuate the switching means and discharge the capacitor through the primary coil in timed relationship with reverse rotation of the engine crankshaft to inhibit engine operation.

3,955,550

FLYWHEEL MAGNETO IGNITION DEVICE WITH CAPACITOR-THYRISTOR IGNITION COMBINED WITH GENERATOR

Hans Thorsten Henrik Carlsson, Amal, Sweden, assignor to Aktiebolaget Svenska Elektromagneter, Sweden

Filed Aug. 13, 1974, Ser. No. 497,130
Int. Cl.² F02P 3/06
U.S. Cl. 123—149 D **6 Claims**



1. In an internal combustion engine having a crankcase and a flywheel casing, and having an electrical power generator system and an electronic ignition system both disposed under the flywheel casing, the combination comprising:

a. means mounting generating coils of the generator system and charging coils of the ignition system on said crankcase within said flywheel casing;

b. radially magnetized permanent magnet means common to both said generator and ignition systems and secured to said flywheel casing in surrounding relation to said generating coils and said charging coils for creating a rotating magnetic field therein:

c. a trigger coil carried on said crankcase and forming a part of said ignition system;

d. at least one trigger magnet, having radially going magnetic flux and axially displaced and carried on said flywhee! casing, for said trigger coil creating a magnetic field therein axially separated from said permanent magnet generator field; and

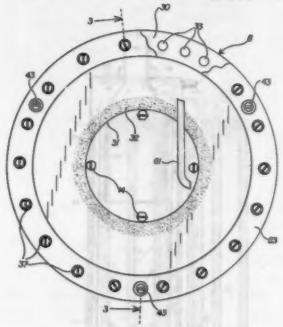
e. a shielding plate of ferromagnetic material non-rotatably carried by said crankcase and disposed between said generator permanent magnet field and said trigger magnet field, said shielding plate being arranged in a radial plane relatively to said flywheel casing.

3,955,551

DIAMOND WHEEL MOUNTING ASSEMBLY

Arthur Y. C. Tang, Framingham, Mass., assignor to General Diode Corporation, Framingham, Mass.

Filed Aug. 27, 1974, Ser. No. 500,857
Int. Cl.² B28D 1/04
U.S. Cl. 125—15 **9 Claims**



1. A cutting device comprising:

a rotatable spindle adapted to be driven by a drive means;

an annular saw blade possessing on its inner periphery a cutting edge, said blade further possessing a plurality of annularly distributed mounting holes;

carrier means supporting said blade on said spindle for rotation therewith and comprising chuck means mounted on said spindle; said chuck means being a hollow cylindrical drum having an open end defined by a peripheral rim and a circumferential flange extending around the outer surface of said drum and longitudinally spaced from said rim, the internal surface of said drum having an annular shoulder defining an annular recess for trapping residue produced during cutting operations, said recess being located between said flange and said rim, said drum further defining a plurality of openings for drawing from said drum the residue produced during cutting operations, said openings extending through a portion of said drum between said flange and said rim and opening into said recess;

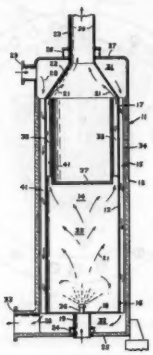
annular clamp means clamping said blade to said chuck means and possessing a plurality of screw holes disposed for alignment with some of said mounting holes and a plurality of alignment holes disposed for alignment with others of said mounting holes, said screw holes being threaded and having minimum diameters smaller than those of said mounting holes with which they are aligned and said alignment holes having minimum diameters equal to those of the mounting holes with which they are aligned, and a plurality of screws extending through said aligned mounting and screw holes, said annular clamp means having an internal diameter that permits said clamp means to pass over said peripheral rim, said annular blade having an internal diameter smaller than the internal diameter of said annular clamp means so as to comprise an inner portion that projects inwardly thereof and is engaged by said peripheral rim, and said screws extending through said alignment holes engage said circumferential flange; and

adjustment means comprising a plurality of U-shaped washers disposed between said flange and said clamp means and received by said screws extending through said alignment holes.

3,955,552
HEATER FOR LARGE FLOWS AT LOW PRESSURE LOSSES

Peter von Wiesenthal, New York, N.Y., assignor to Heat Research Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 462,050, April 18, 1974, abandoned. This application Feb. 24, 1975, Ser. No. 552,131
Int. Cl.² F24H 3/02
U.S. Cl. 126—110 R **1 Claim**



1. A heater for a large flow of air to be heated at a low pressure loss for use in an incinerator, the heater comprisng in combination: a cylindrical shell, a cylindrical sleeve mounted coaxially in the shell and separating to form an inner flow space and an outer flow space, a bellows positioned about the sleeve outwardly of the shell and connecting the sleeve expandably to the shell at one end of the shell and the sleeve connected fixedly to the shell at the other end of the shell, air means for passing the air to be heated through the outer flow space, hot gas means for passing a hot gas through the inner flow space, the hot gas means including at least one burner connected to supplies of fuel and oxygen as well as penetrating the shell to introduce the hot gas into the inner flow space, the sleeve having an entrance end for entry of the hot gas and an exit end for exit of the hot gas, outer extended surface projecting from the sleeve into the outer flow space, a baffle mounted inwardly of the sleeve and organized to channel the hot gas into a convection passage boardered outwardly by the sleeve and inwardly by the baffle, inner extended surface projecting from the sleeve into the convection passage, the baffle cylindrical with a closed end projecting into the exit end of the sleeve so that the convection passage is annular and located in the vicinity of the exit end, means to provide superatmospheric pressure in the inner flow space.

3,955,553
AUXILIARY HEATER FOR FIREPLACES

Eldred E. Soeffker, Minneapolis, Minn., assignor to Peter Magnolo, Coon Rapids, Minn.

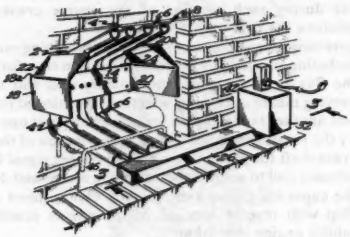
Filed May 23, 1974, Ser. No. 472,876
Int. Cl.² F24H 3/08
U.S. Cl. 126—121 **3 Claims**

1. An auxiliary heater for use in conjunction with an existing fireplace comprising:

a heat exchanger comprised of a plurality of laterally spaced apart, generally U-shaped air flow tubes, each tube being disposed upright in a vertical plane and having a bottom, horizontally extending tubular segment with an air inlet opening at its front end, an upright, rear tubular segment, and a top, tubular segment extending forwardly from the rear tubular segment of each tube and having an air discharge opening at its front end;

an upright, rear plate of heat conductive material extending horizontally across said upright, rear tubular segments over a substantial portion of the height thereof and secured thereto in direct, heat conductive relation therewith; and

a pair of upright, laterally spaced apart baffle plates of heat conductive material connected to and extending forwardly from the opposite ends of said rear plate at laterally spaced apart locations along opposite sides of said bottom tube segments and vertically positioned between said top and bottom tubular segments of said heat ex-

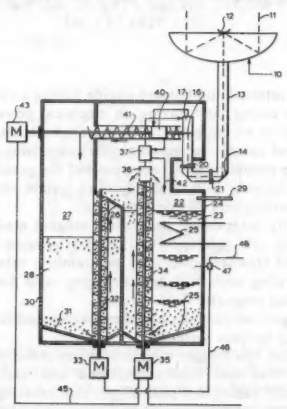


changer, each of said baffle plates including an uppermost deflector panel which angles upwardly and inwardly towards said top tubular segments to direct heated air rising from the fireplace around and between said top tubular segments, whereby, with said heat exchanger positioned within a fireplace with said rear tubular segments near the rear, upright wall of the fireplace, heated air rising in the fireplace will pass over and against said baffle plates, and the heated baffle plates will conduct heat through the rear plate to the upright, rear tubular segments to assist in heating air flowing therethrough.

3,955,554
SOLAR HEATING SYSTEM

Robert L. Collie, 2507 Catalina Drive, Orlando, Fla. 32805

Filed Apr. 29, 1974, Ser. No. 465,089
Int. Cl.² F24J 3/02
U.S. Cl. 126—270 **11 Claims**



1. A heating apparatus comprising in combination:

a. liquid storage chamber for storage of a liquid;

b. dry chemical storage chamber for storage of a chemical which generates heat when mixed with said liquid in said liquid storage chamber;

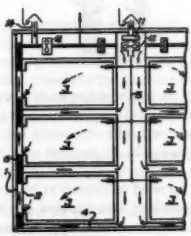
c. conveyor means connecting said dry chemical storage to said liquid storage chamber including means to transfer said dry chemical from said dry chemical storage chamber into said liquid storage chamber when actuated;
d. heat exchange means located in said liquid storage chamber and operatively connected to transfer heat from said liquid in said chamber to the exterior of said liquid storage chamber;
e. means for removing dry chemical transferred to said liquid storage chamber
f. solar heating means for drying said chemical being removed from said liquid storage chamber with a solar heater; and
g. means for transferring said dry chemical back into said dry chemical storage chamber whereby a heating system may have prolonged storage of heat.

9. A solar heating method comprising the steps of
a. transferring calcium oxide into a tank of water to convert said calcium oxide to calcium hydroxide thereby releasing heat;
b. removing heat from said water tank;
c. converting calcium hydroxide to calcium oxide including the step of removing excess moisture from the calcium hydroxide and heating said calcium hydroxide in a solar heating chamber; and
d. transferring said calcium oxide to a storage chamber whereby solar energy may be stored for extended periods of time.

3,955,555
AIR AND HEAT CIRCULATION SYSTEM FOR BUILDINGS

Lars Arne Bostrom, Geneva, Switzerland, assignor to Clima Wall Ltd., Chur, Switzerland

Filed Mar. 29, 1974, Ser. No. 456,563
Claims priority, application Sweden, Mar. 30, 1973, 7304523
Int. Cl.² F24J *3/02*
U.S. Cl. 126—270 **10 Claims**

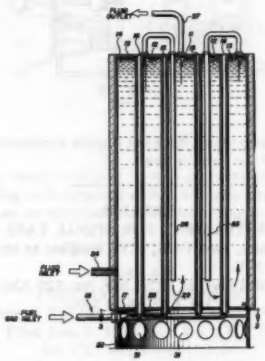


1. An air and heat circulation system for a building having window openings provided with two spaced apart window panes at least one of which has the property of absorbing sunheat radiation and between which air is allowed to pass, comprising a first air duct system including at least one closed channel portion for circulating air absorbing the heat from the window, which closed channel portion includes as a part thereof said spaces between said window panes and channels in the structural portion of the building connected to said spaces, blower means for imparting to the air in said first air duct system a flow rate which varies depending on the desired room temperature within the building, and a second duct system including a special channel system connected to individual rooms within the building for supplying ventilation air thereto, and blower means imparting to the air in said spaced channel system a speed determined by the desired room ventilation.

3,955,556
CATALYTIC FLUID HEATER

Jon B. Pangborn, Lisle, and John C. Sharer, Evanston, both of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Continuation-in-part of Ser. No. 443,128, Feb. 15, 1974, abandoned. This application July 17, 1974, Ser. No. 489,402
Int. Cl.² F24H *1/00*
U.S. Cl. 126—362 **8 Claims**



1. A catalytic fluid heater comprising a plurality of nested, fluid heating chambers spaced from one another to provide therebetween a heating zone, a catalyzed surface in contact with the walls of adjacent ones of said fluid heating chambers, and manifold means for delivering a fuel gas which is rich in hydrogen to said heating zones, said fluid heating chambers being proportioned to create a chimney effect to produce a fuel flow comprising said fuel gas and air through said heating zone from the bottom to the top thereof to effect contact with and combustion of said fuel on said catalyzed surface and to assure sufficient excess air inspiration for complete combustion, whereby heat is transferred through said catalyst and said walls to heat a fluid in said fluid heating chambers and innocuous combustion products result so that no external venting to the atmosphere is required.

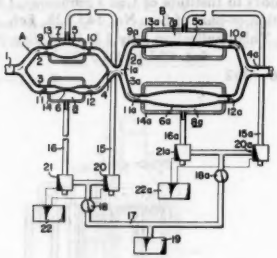
3,955,557
BLOOD PUMP FOR USE IN AN ARTIFICIAL HEART OR SUCH PURPOSE

Hiroyuki Takagi, No. 39-3, Nagane, Narumi-cho, Midori, Nagoya, Aichi, Japan

Filed Sept. 30, 1974, Ser. No. 511,024
Claims priority, application Japan, Oct. 1, 1973, 48-110329
Int. Cl.² A61M *1/03*; **A61F** *1/24*
U.S. Cl. 128—1 D **4 Claims**

1. A blood pump for use in an artificial heart or the like, said pump comprising an intake main tube, an output main tube, a connecting tube, an intake pump system and an output pump system connected in series with each system including two flexible branch tubes, a flow-in side leaflet valve and a flow-out side leaflet valve in each branch tube, said branch tubes in the intake pump system communicating at their in-flow ends with the intake tube and communicating at their flow-out end with a first end of the connecting tube, said branch tubes in the output system communicating at their in-flow end with the connecting tube and communicating at their flow out end with the output tube, means for alternately collapsing and expanding the branch tubes in each system with

the frequency of pulsation of the intake pump system different from the frequency of the output pump system thereby providing a blood pump which does not require synchronization with the rhythm of the natural heart.

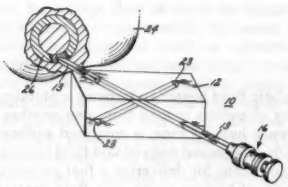


3,955,558

INSTRUMENT FOR SPINAL TAPS

Richard C. Fuisz, New York, N.Y., assignor to Medcom, Inc., New York, N.Y.

Filed Nov. 4, 1974, Ser. No. 520,320
Int. Cl.² A61B 5/00
U.S. Cl. 128—2 B **5 Claims**



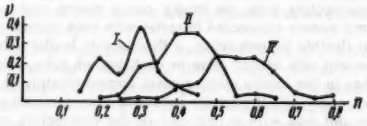
1. A surgical device comprising a tubular hypodermic needle of triangular transverse cross-section and having a distal end beveled along a plane with the distal tip of said needle coinciding with an apex of the triangular section of said needle, a stylet slideably telescoping said hypodermic needle and guide means for restricting said needle to movement in an axial direction at a predetermined orientation and preventing the rotation of said needle about its longitudinal axis.

3,955,559

METHOD OF CYTOLOGICAL DIAGNOSIS OF PRECANCER CONDITIONS AND CANCER

Velta Mikelevna Bramberga, ulitsa Gergora, 8, kv. 20; Arkady Yakovlevich Khesin, ulitsa Suvorova, 16, kv. 18; Teodor Arvidovich Grendze, ulitsa Suvorova, 16, kv. 24, and Mark Naumovich Libenson, ulitsa Sverdlova, 7, kv. 2, all of Riga, U.S.S.R.

Filed Aug. 13, 1974, Ser. No. 496,996
Int. Cl.² A61B 5/00
U.S. Cl. 128—2 R **1 Claim**



1. A method for the cytological diagnosis of cancer and precancer conditions, comprising taking a cytological preparation from a suspected patient; measuring the area of the nucleus and the area of the cytoplasm in each cell under examination; determining the coefficient of the cell size $\eta(c)$ for each said cell according to the relationship

$$\eta(c) = \nu + cS_1 = (S_1/S_2) + cS_1$$

where

ν = the nucleus to cytoplasm ratio

S_1 = the area of the nucleus

S_2 = the area of the cytoplasm

C = a constant coefficient of from 0 to 0.025;

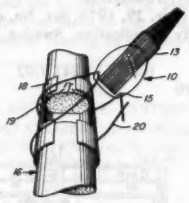
selecting from the thus obtained multitude of cell size coefficients, the values exceeding 0.5; and determining the mean value for the selected values of the cell size coefficients, whereby if said mean value of the cell size coefficient falls within the range of from 0.0 to 0.6, the preparation is considered to belong to a healthy person; if the mean value of the cell size coefficient is from 0.6 to 0.8, the preparation is considered to belong to a patient with a precancer condition; and, finally, if the mean value of the cell size coefficient exceeds 0.9, the preparation is diagnosed as belonging to a patient with cancer.

3,955,560

IMPLANTABLE NEURAL ELECTRODE

Richard B. Stein, 16 Wellington Crescent; Dean Charles, 11583 8D Ave., both of Edmonton, Alberta, and Allan Mannard, 4137 Ave. de l'Esplande, Montreal, Quebec, all of Canada

Filed June 10, 1974, Ser. No. 477,644
Int. Cl.² A61B 5/05; A61N 1/04
U.S. Cl. 128—2.1 E **12 Claims**



1. The method of establishing individual connections between a series of electrical conductors and a series of excitable animal fibers, said method comprising the steps of providing a series of passageways in an implant unit of a material that is a non-conductor of electricity and biologically inert, each passageway dimensioned to permit at least one fiber to regenerate therein, providing conductors having electrodes and exposing each electrode in the appropriate one of said passageways, cutting the nerve or muscle containing said fiber to an extent such that the series thereof are severed, and placing the passageways in the cut in a position in which each fiber will regenerate in an appropriate one of them and thus form a connection with the electrode exposed therein.

4. An implant unit for use in establishing individual connections between a series of electrical conductors and a series of excitable fibers of a nerve or muscle cut transversely to sever a plurality of its fibers, said implant unit comprising a member of material that is a non-conductor of electricity and is biologically inert, and includes a portion for entry into the cut and having a series of passageways extending completely through it in a position to be within the nerve when the portion is placed in the cut with the series of passageways transversely thereof and the open ends of each passageway disposed to provide potential paths through which the severed fibers may regenerate, the portion being of a thinness such that, when the implant portion is placed in the cut between the ends of said severed fibers, only a few of the severed fibers are in a position in which ingrowth into the implant is inhibited, and electrical

conductors within said member each conductor including an electrode portion exposed in the appropriate one of the passageways and a portion extending exteriorly of the member in a position to be exposed when the implant portion is in place, each passageway of a length and cross sectional area such that at least one severed fiber will regenerate therein and form a conductive connection with the electrode portion exposed therein, the ratio of the length of each passageway to its diameter being at least seven.

3,955,561

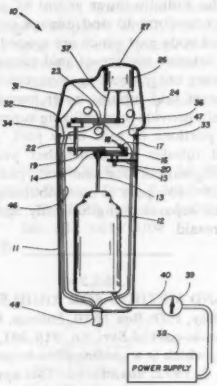
CARDIOSCAN PROBE

Reginald C. Eggleton, Indianapolis, Ind., assignor to Indianapolis Center for Advanced Research, Inc., Indianapolis, Ind.

Filed Sept. 16, 1974, Ser. No. 506,565

Int. Cl.² A61B *10/00*

U.S. Cl. 128—2.05 Z **9 Claims**



1. Ultrasonic probe apparatus comprising:
an elongated probe housing having a longest dimension;
a transducer pivotally mounted near an end of the housing and having a face adjacent the surface of the housing, the transducer being pivoted about an axis in a plane approximately perpendicular to the longest dimension of the housing;
linkage means in the housing for pivotally oscillating the transducer about its axis when the linkage means is activated;
motor means coupled to the linkage means for activating the linkage means; and
means coupled to the transducer for causing the transducer to produce ultrasonic pulses.

3,955,562

APPARATUS FOR MEASURING RANGE OF MOTION

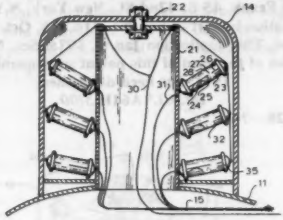
Edward L. Farrar, Jr., 1315 S. Orange Ave., Orlando, Fla. 32806

Filed May 19, 1975, Ser. No. 578,549

Int. Cl.² A61B *5/10*

U.S. Cl. 128—2 S **13 Claims**

1. An apparatus for measuring the range of motion of an individual comprising in combination:
a base;
a plurality of switches mounted to said base in a plurality of predetermined positions, each switch being actuated by moving said base a predetermined angle in a predetermined direction;
attaching means connected to said base for attaching said base and switches to an object to be tested; and



recording means coupled to said plurality of switches for recording each actuated switch whereby a range of movement can be recorded on said recording means.

3,955,563

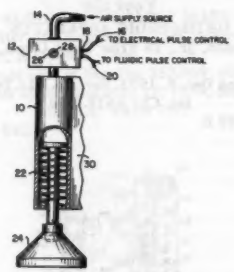
PNEUMATIC PERCUSSOR

Albert Maione, 5 Vincent St., Parlin, N.J. 08859

Filed Jan. 6, 1975, Ser. No. 538,770

Int. Cl.² A61H *7/00, 23/00*

U.S. Cl. 128—53 **9 Claims**



1. A pneumatic percussor for stimulating lung cavities comprising:
an air chamber apertured at opposite ends thereof;
a plunger positioned within said chamber, having both a bearing surface and an arm extending through one of said apertures;
a valve having an input port adapted to be connected to an air supply, an output port intercoupled with the other one of said apertures of said chamber, and a control port;
suction means affixed adjacent the end of said plunger arm outside of said chamber; and
means coupled to the control port of said valve to alternately gate the passage of air from a connected supply via said valve into said chamber so as to bear against said surface of said plunger and actuate said plunger in a direction outwardly of said chamber; and
wherein said last-mentioned means includes an oscillator to gate the passage of air into said chamber in impulse manner, to actuate the plunger within at an impulse frequency to vibrate lung cavities towards a cough reflex.

3,955,564

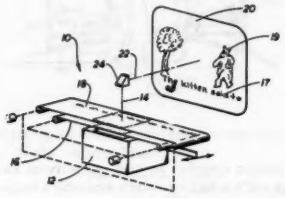
METHOD OF IMPROVING OCULAR FIXATION, SEQUENTIAL SCANNING AND READING ACTIVITY IN DYSMETRIC DYSLEXIC CHILDREN

Harold N. Levinson, 15 Lake Road, Great Neck, N.Y. 11020, and Jan Frank, 45 E. 42nd St., New York, N.Y. 10028

Continuation-in-part of Ser. No. 516,796, Oct. 21, 1974, abandoned. This application Jan. 6, 1975, Ser. No. 538,967 The portion of the term of this patent subsequent to Oct. 22, 1991, has been disclaimed.

Int. Cl.[2] A61H *5/00*

U.S. Cl. 128—76.5 **5 Claims**



1. An eye exercise procedure for improving ocular fixation, sequential scanning and reading performance in a child previously identified as having a cerebellar-vestibular dysfunction resulting in dyslexia, said procedure comprising the step of inducing an eye oscillation of a selected extent which is normally below the threshold level producing blurred vision for said child, whereby repetition of said induced eye oscillation results in compensation for the child's cerebellar-vestibular induced dysfunction.

3,955,565

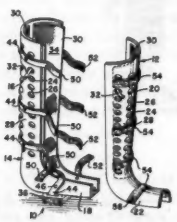
ORTHOPEDIC APPARATUS

Glenn W. Johnson, Jr., 10 Friar Tuck Circle, Summit, N.J. 07901

Filed Dec. 5, 1973, Ser. No. 421,747

Int. Cl.[2] A61F *5/04*

U.S. Cl. 128—89 R **18 Claims**



1. Orthopedic apparatus for immobilizing a body part comprising:

a pair of complementary half-shell members, each of said half-shell members being generally channel shaped in transverse cross-section and having a pair of radially spaced, longitudinally extending opposed free edges,

said shell members being relatively rigid about an axis lying in planes defining said transverse cross-section and being relatively flexible about an axis substantially perpendicular to said first-mentioned axis whereby the opposed radially spaced free edges of each half-shell member are adapted to be flexed relative to one another to selectively decrease or increase the inside diameter of each said half-shell member respectively,

said shell members adapted to be fitted relative to each other about said body part in a substantially diametrically opposed manner with the opposed radially spaced free edges of said half-shell members being concentrically nested to define a radially telescoped tubular outer member surrounding said body part and generally conforming to the shape thereof,

said half-shell members being radially telescopingly adjusted relative to each other about said body part such that separate longitudinally spaced portions of the inner surface of each of said half-shell members are adapted to engage said part in an abutting manner at corresponding longitudinally spaced locations along said body part respectively,

said half-shell members including means for releasably securing same together in said adjusted radially telescoped relation; and

a plurality of pneumatically inflated cells disposed within said half-shell members in a circumferentially juxtaposed manner, said inflated cells extending longitudinally with respect to said half-shell members and adapted to extend radially inwardly between the interior surface of said tubular outer member and said body part, at least portions of the radially inner extent of said inflated cells adapted to conform to and engage corresponding portions of said body part which are spaced radially inwardly from said interior surface of said tubular outer member and which are not in abutting engagement with said interior surface of said tubular outer member whereby said inflated cells provide immobilizing support for said corresponding portions of said body part, and said radially telescoped tubular outer member provides additional immobilizing support for said body part by virtue of engaging said body part in said abutting manner at said plurality of separate longitudinally spaced locations as hereinaforesaid.

3,955,566

SYSTEM AND METHOD FOR RIGID ENCLOSURES

Donald G. Stoffey, P.O. Box 1610, Salinas, Calif. 93901

Continuation-in-part of Ser. No. 318,201, Jan. 8, 1973, abandoned, which is a continuation-in-part of Ser. No. 224,220, Feb. 7, 1972, abandoned. This application Jan. 19, 1973, Ser. No. 323,421

Int. Cl.[2] A61F *5/04*

U.S. Cl. 128—90 **17 Claims**

1. A method for preparing a rigid enclosure comprising the steps:

a. wrapping the object to be enclosed with a free radical organic peroxide catalyst impregnated fabric;

b. applying to said fabric an activated thermosetting vinyl resin activated with a tertiary aromatic amine;

c. allowing said fabric to harden about said object.

3,955,567

BONE BRACE

James W. Richmond, Comstock Township, Kalamazoo County, and Jeffrey S. Topf, Huntington Woods, both of Mich., assignors to Stryker Corporation, Kalamazoo, Mich.

Filed Nov. 8, 1974, Ser. No. 522,024

Int. Cl.[2] A61F *5/04*

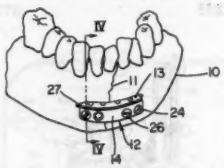
U.S. Cl. 128—92 D **3 Claims**

1. A three-dimensional bone brace for securement to an injured mandible having a groove cut in the lateral surface thereof, comprising:

an elongated L-shaped metallic angle member having first and second substantially rectangular flanges disposed substantially at right angles to each other, each of said flanges having a free edge extending longitudinally of said angle member, the free edges of said flanges being substantially parallel;

means for permitting said first flange to be bent into a substantially arcuate and nonplanar shape conforming to the lateral surface of the mandible when a material bending force is applied to said angle member, said means comprising a plurality of substantially uniformly spaced slots in said second flange, each slot extending trans-

versely of said second flange from a point substantially adjacent the inner surface of the first flange through the free edge of said second flange, said slots permitting bending of said second flange within the plane thereof; and



a plurality of openings extending through said first flange for reception of screw means whereby said first flange can be fixedly secured snugly against the lateral surface when the second flange is disposed within a said groove in said mandible, said openings being spaced inwardly from the free edge of said first flange, and the free edge of said first flange being substantially straight and continuous throughout the length of said angle member.

3,955,568

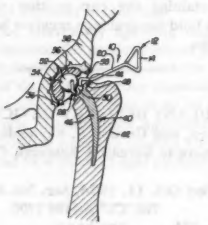
TOOL AND METHOD FOR USE IN TOTAL HIP IMPLANT

Alonzo J. Neufeld, 1650 Parway Drive, Glendale, Calif. 91206

Filed Apr. 17, 1975, Ser. No. 569,053

Int. Cl.[2] A61F *5/04*

U.S. Cl. 128—92 E **10 Claims**



1. For use in total hip implant surgery, a tool for inserting a prosthetic femoral head into and for removing from a prosthetic hip socket, comprising:

a handle, an intermediate portion and an inner end portion,

means on said inner end portion having two spaced members to engage the neck of the femoral head and to engage the femoral head extending from the femur and for applying a twisting motion to the head and femur, the intermediate portion connecting the handle and the inner end portion and extending in a direction substantially perpendicular to said two spaced members, said inner end portion being connected to said intermediate portion by a portion offset with respect to said intermediate portion.

3,955,569

SURGICAL DRAPE

Henrietta K. Krzewinski, Old Bridge, and Thomas M. Gorrie, Plainsboro, both of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Jan. 29, 1975, Ser. No. 545,288

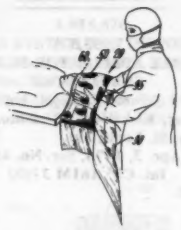
Int. Cl.[2] A61F *13/00*

U.S. Cl. 128—132 D **13 Claims**

1. A surgical drape comprising:

a. a main sheet of flexible, drapable material, said main sheet having an upper surface, a lower surface, a top edge, an upper portion adjacent said top edge, a bottom edge, and opposed side edges;

b. a cuff overlying the upper surface of said upper portion of said main sheet, said cuff having a top edge, a bottom edge, and opposed side edges, said cuff being integral with said main sheet along the respective top edges of said cuff and said main sheet, said cuff being further secured to the upper surface of said main sheet along generally



longitudinally extending lines of attachment which are spaced inwardly a substantial distance from the side edges of said main sheet, whereby, after said cuff has been attached to said main sheet along said lines of attachment, a hand receiving pocket is provided in said drape; and

c. a strip of adhesive for removably adhering the drape to the body of a patient, said strip of adhesive being secured to the lower surface of said main sheet.

3,955,570

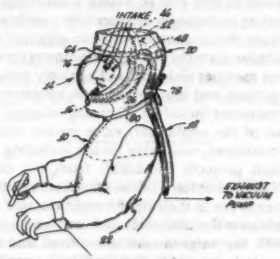
SURGICAL EXHAUST MASK

Charles G. Hutter, III, Hollywood, Calif., assignor to Physical Systems, Inc., Hollywood, Calif.

Continuation-in-part of Ser. No. 252,069, May 18, 1972, abandoned. This application May 17, 1974, Ser. No. 470,985

Int. Cl.[2] A62B *7/02*

U.S. Cl. 128—142.7 **5 Claims**



1. A surgical exhaust mask comprising

a support member sized and shaped to fit on the head of the wearer and including a head band adapted to surround the head in a generally horizontal position;

a removable transparent face plate releasably carried by said support member to extend downwardly from said member and having a spherical configuration;

a suction ventilation conduit opening into the space enclosed by said transparent face plate at the bottom thereof, said conduit at least in part being a flexible tube extending rearwardly and downwardly from said face plate and having its forward portion supported from said support member;

aperture means in the upper portion of the face plate to permit ingress of air from the exterior of said plate and angled inwardly and downwardly to direct the inflow

close to the inner surface of the face plate to prevent fogging; and

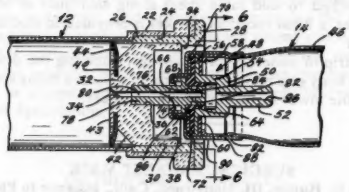
a hood of flexible sheet material extending over said support member to a point below said face plate and ventilation conduit adapted to enclose the head and shoulders of the wearer, said hood having an opening through which said face plate projects, and the suction from said ventilation conduit drawing said hood against said support member, said face plate, and the head and shoulders of the wearer.

3,955,571

RECHARGEABLE APPLICATOR FOR DISPENSING SUBSTANCES

Robert M. Sunnen; Jerome J. Siegel, both of St. Louis, and Harold T. Rutter, Kirkwood, all of Mo., assignors to The Emko Company, St. Louis, Mo.

Filed Apr. 3, 1974, Ser. No. 457,415
Int. Cl.² A61M 37/00
U.S. Cl. 128—235 **6 Claims**



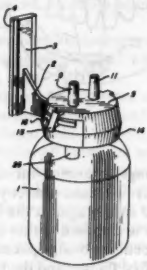
1. An assembly combining a dosage applicator and a charged container, the applicator including a tubular member partially closed at one end to define a discharge outlet, said tubular member including a substantially continuous side wall extending from the discharge outlet to adjacent the opposite end, said tubular member having an uninterrupted inner surface, a piston member slideably and sealably positioned in the applicator portion and movable therein between the opposite ends, said container including a housing adapted to be moved into and out of the applicator, valve means attached to one end of the container, said valve means including a valve stem portion which projects endwardly from the container and through which the contents of the container are expelled when the valve means are in their open condition, said stem portion being movable on the container between an inoperative position in which the valve means are closed and an operative position angularly related to the inoperative position in which the valve means are open, means connecting the projecting valve stem portion to the piston member for movement in concert therewith in the applicator, said piston member having passage means therethrough that communicate with the passage means in the valve stem portion, the container and the applicator including the piston member being relatively angularly movable only when the piston member is positioned in the applicator adjacent to the end thereof opposite from the partially closed end in which position the container is substantially withdrawn from the applicator whereby the stem portion of the valve means can be moved to the open position to permit discharge of some of the contents of the container into the applicator, said container and the attached piston member being thereafter movable in the applicator toward the partially closed end thereof to force the contents of the applicator out through the discharge outlet.

3,955,572

DISPOSABLE CAP AND FLOAT ASSEMBLY

Gordon D. Martin, Mundelein, Ill., assignor to Aeros Instruments, Inc., Northbrook, Ill.

Filed Dec. 20, 1974, Ser. No. 534,844
Int. Cl.² A61F 5/44
U.S. Cl. 128—275 **12 Claims**



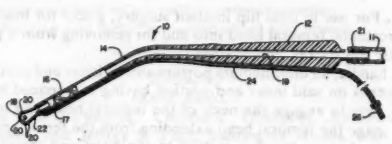
1. A disposable cap assembly and drainage receiver combination, comprising: a drainage receiver having an open upper mouth a bifurcated bracket having means to vertically retain the drainage receiver between the bifurcations, a cap portion for sealing the open mouth of the drainage receiver, the cap portion being vertically downwardly positionable onto the top of the drainage receiver, and complementary vertically engaging surface means on the bifurcated bracket and the cap portion for retaining the cap portion vertically onto the bracket and to hold the drainage receiver between the bracket and cap portion.

3,955,573

ANTICOAGULANT DELIVERY DEVICE AND METHOD

A. Boyd Hansen, and Gordon S. Reynolds, both of Bountiful, Utah, assignors to Sorenson Research Co., Inc., Salt Lake City, Utah

Filed Oct. 11, 1974, Ser. No. 514,055
Int. Cl.² A61M 1/00
U.S. Cl. 128—276 **11 Claims**



1. An anticoagulant delivery device for aspirating and treating blood comprising in combination:

a hollow conduit, the hollow of the conduit having a vacuum applied thereto and defining a pathway for the transport of aspirated blood;

a perforated tip joined to the conduit and comprising a passageway facilitating aspiration of blood into the hollow of the conduit;

a mixing chamber comprising a housing having means for altering laminar flow of aspirated blood so as to create mixing turbulence therein, said mixing chamber being interposed between the conduit and the perforated tip; and

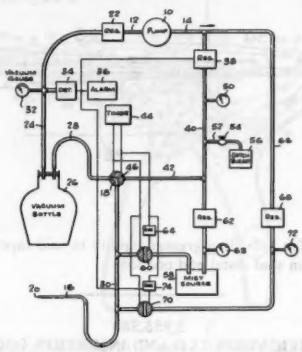
means for delivering anticoagulant in the vicinity of the tip upstream from the mixing chamber whereby the anticoagulant is caused to be thoroughly mixed with the aspirated blood.

3,955,574

PUMPING SYSTEM FOR CATHETER SUCTION UNITS

Morton K. Rubinstein, 14954 Corona Del Mar, Pacific Palisades, Calif. 90272

Filed Dec. 9, 1974, Ser. No. 531,179
Int. Cl.² A61M 1/00
U.S. Cl. 128—278 17 Claims



1. A pumping system for a suction unit designed for suction of fluids and viscous materials from a human body, said pumping system comprising:

pumping means for providing a source of positive pressure and a source of negative pressure;

catheter means for drawing fluids and viscous materials therethrough in response to the application of negative pressure to said catheter means; and

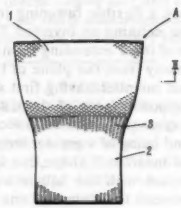
control means for alternately applying negative pressure and positive pressure, for predetermined periods of time, from said pumping means to said catheter means to produce suction of fluids and viscous materials through said catheter means when positioned in or on said fluids and viscous materials, the alternate application of negative pressure and positive pressure causing continuous cyclic reversals of fluid flow through said catheter means during said suction.

3,955,575

DIAPER

Yoshizo Okuda, 3-16 Gakuenkita 1-chome, Nara, Japan

Filed Dec. 13, 1974, Ser. No. 532,607
Int. Cl.² A61F 13/16
U.S. Cl. 128—284 33 Claims



1. A textile cloth diaper comprising

a body of tubular knitted form adapted to lay flat in open ready-to-use condition thereby providing two substantial plies for the body;

said body having upper and lower generally half portions, of which said upper half portion is of greater lateral width than said lower half portion;

said body being comprised of a combination of cotton and at least one other special finished synthetic fiber;

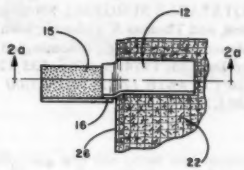
said cotton and synthetic fibers being so combined and arranged so that said tubular body has an integral, soft, pile-covered outer surface of cotton fibers only, and smooth pile-free inner surfaces, the latter constituted by two adjacently opposed plies having substantially contiguous smooth inner surfaces when in said flat ready-to-use condition.

3,955,576

TAPE FASTENER SYSTEM FOR DISPOSABLE DIAPERS

Robert D. Safford, Sao Paulo, Brazil, assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Apr. 21, 1975, Ser. No. 569,879
Int. Cl.² A61F 13/16
U.S. Cl. 128—287 5 Claims



1. A tape fastener system in combination with a disposable diaper of the type which comprises an absorbent core interposed between a fluid-pervious body-contacting cover sheet and a fluid-impervious backing sheet, said tape fastener system comprised of a composite tape formed from two strips of flexible sheet material coated with pressure-sensitive adhesive on one surface and a release coating on the other surface, said strips being longitudinally aligned and joined to each other at a narrow zone of overlap with the adhesive surfaces of the overlapped strips being in contact at the zone of overlap to form a permanent bond, one end portion of the composite tape adjacent the overlap zone having its adhesive disposed on the face of the composite tape opposite from that face of the composite tape on which the adhesive of the other end portion is disposed, the first end portion of said composite tape being secured by said adhesive to the cover sheet of said diaper at one corner adjacent the diaper edge, and the second end portion of said composite tape being adapted to extend beyond the edge of the diaper for use in fastening the diaper around the waist.

3,955,577

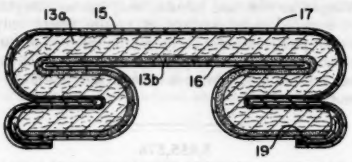
RESIN TREATED ABSORBENT PAD OR WEB FOR BODY FLUIDS

Dale A. Gellert, Aurora, Ind.; Kendall L. Harden, and John R. Noel, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 452,095, March 18, 1974, Pat. No. 3,901,238. This application Feb. 18, 1975, Ser. No. 550,799
Int. Cl.² A61F 13/16
U.S. Cl. 128—290 R 10 Claims

1. A unitary, soft, reinforced, body fluid absorbent web suitable for use as an absorbent core in a disposable diaper, said web having a means for the rapid transport of body fluids throughout the web comprising a mass of entangled, hydrophilic fibers, the fibers on the surface thereof oriented toward the wearer's body having a coating of a hydrophobic, film-forming material thereon, the surface of said absorbent web containing said coated hydrophilic fibers exhibiting a lower density than the portions of said web containing uncoated hydrophilic fibers, thereby providing a capillary size gradient favorable to the transmission of liquid from the surface of said web containing said coated fibers to the portions of said web

containing said uncoated fibers, said absorbent web having an overall density between about 0.09 grams per cubic centimeter and about 0.13 grams per cubic centimeter, as measured under a load of 20 grams per square centimeter, and a wet tensile strength of at least about 0.5 pounds per inch of width.

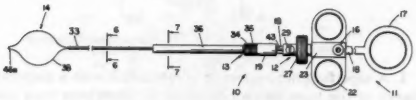


3,955,578

ROTATABLE SURGICAL SNARE

Dale L. Chamness, and Thomas A. Osborne, both of Bloomington, Ind., assignors to Cook Inc., Bloomington, Ind.

Filed Dec. 23, 1974, Ser. No. 535,420
Int. Cl.² A61B *17/32*; A61N *3/00*
U.S. Cl. 128—303.15 **11 Claims**



1. A surgical snare comprising the combination of:

a. an elongated flexibly bendable sheath having proximal and distal ends;

b. a torque transmitting electrically conductive center member extending in said sheath having proximal and distal ends adjacent those of the sheath and being rotatable therein, said center member also being flexibly bendable with said sheath to conform to tortuous body cavities;

c. an electrically conductive snare loop means connected to the distal end portion of said center member, said center member and said snare loop means each forming a part of an operating loop assembly which is the only structure in said sheath;

d. actuating means connected to the proximal end portion of said center member and to said sheath for moving said center member relative to said sheath between a retracted position in which said snare loop means is nested within said sheath and an extended position in which said snare loop means extends beyond the distal end of said sheath and is free to open and form a loop;

e. rotating means rotatably mounted on said actuating means for rotating said center member about its longitudinal axis while said actuating means remains stationary; and

f. means for electrically connecting said snare loop means to a power source through said center member.

3,955,579

VACUUM CURET

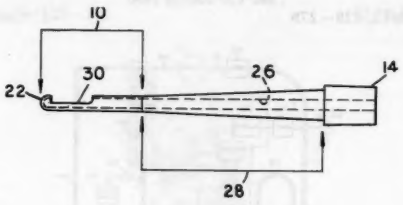
Henry Bridgman, c/o Bridgman & Co. P.O. Box 71, Convent Station, N.J. 07961

Filed July 23, 1973, Ser. No. 381,740
Int. Cl.² A61B *17/22*
U.S. Cl. 128—304 **10 Claims**

1. A vacuum curet comprising

a tube of flexible material having a central lumen extending therethrough, a distal end portion adopted to be inserted into a body cavity, a proximal end portion adopted to be connected to a vacuum source, and an intermediate tapered shank;

said distal end portion having a narrow predetermined, outside diameter; and means for curetting at its tip region; and



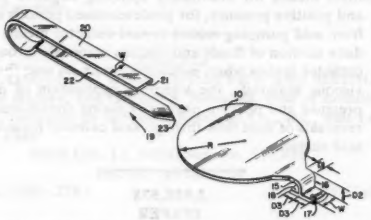
means for providing greater rigidity in said tapered shank than in said distal end portion.

3,955,580

IDENTIFICATION TAG AND INSERTION TOOL FOR CATTLE

Roy Dale Thompson, 12698 Ojai Road, Santa Paula, Calif. 93060

Filed Mar. 20, 1975, Ser. No. 560,129
Int. Cl.² A61D *1/00*; A61B *17/00*
U.S. Cl. 128—330 **3 Claims**



1. An identification tag and insertion tool for cattle, comprising:

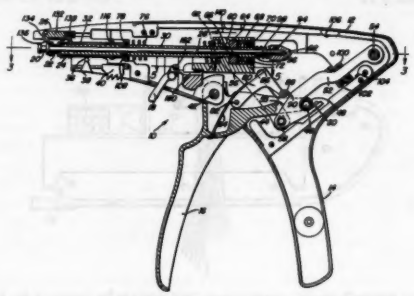
a. a disc having a flexible fastening including a stem and cross portion defining an inverted T-shape with the end of said stem of the T extending from a peripheral portion of the disc away from the plane of the disc; and

b. an elongated member having first and second arms for straddling opposite faces of the disc with the first arm terminating in a square end and a second arm terminating in a point and being of a greater length than the first arm whereby the inverted T-shape can be flexed towards an upright position with the square end of said first arm received between the stem and one cross portion of the T-shape, the other arm passing under and holding the stem of the T-shape and the other cross portion in their flexed positions so that the point on said second arm can pierce the ear of a cow to provide an opening in a generally vertical plane when the cow is standing and the T-shape then urged through the opening by the first arm, withdrawal of the arms permitting the T-shape to assume its original position relative to the disc so that the cross portions of the T-shape overlie the upper and lower edges of the opening to thereby secure the disc to the cow's ear.

3,955,581
THREE-STAGE SURGICAL INSTRUMENT

Anthony D. Spasiano, Old Greenwich, and Douglas G. Noiles, New Canaan, both of Conn., assignors to United States Surgical Corporation, New York, N.Y.

Filed Oct. 18, 1974, Ser. No. 516,112
Int. Cl.² A61B 17/04
U.S. Cl. 128—334 R **20 Claims**



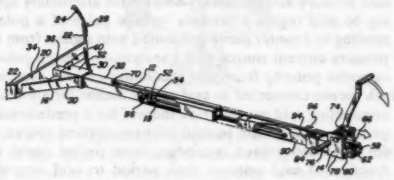
1. A surgical instrument adapted to associate with and operate a staple-carrying cartridge having a three-stage operation and including means for ligating an organic tubular structure in a first stage of said operation, means for suturing said structure in a second stage of said operation and means for dividing said structure in a third stage of said operation, the instrument comprising: a main body portion; first, second and third attachment means associated with said main body portion and moveable with respect to said main body portion and with respect to one another to power said three-stage operation of said staple-carrying cartridge, said first attachment means adapted to associate with said dividing means, said second attachment means adapted to associate with said suturing means and said third attachment means adapted to associate with said ligating means; trigger means moveably mounted on said main body portion; linking means operatively connecting said trigger means to said second attachment means so that actuation of said trigger means causes said second attachment means to move relative to said main body portion to cause said structure to be sutured during said second-stage of said operation; coupling means associated with said second and third attachment means for coupling said third attachment means to said second attachment means and for causing said third attachment means to move relative to said main body portion during said first-stage of said operation for ligating said structure; and means operatively connecting said trigger means to said first attachment means so that actuation of said trigger means causes said first attachment means to move relative to said third attachment means during said third-stage of said operation for dividing said structure.

3,955,582
OBSTETRICAL TOOL FOR ANIMALS

Richard C. Pierce, Stratton, Nebr., assignor to Vivian L. Pierce, Stratton, Nebr., a part interest

Filed Apr. 25, 1975, Ser. No. 571,704
Int. Cl.² A61D 1/08
U.S. Cl. 128—352 **10 Claims**

1. An obstetrical device for assisting cows in giving birth to their calves which comprises: a rigid generally U-shaped yoke effective to bridge the flanks of a cow and confine same against lateral movement; strap means attached to opposite ends of the yoke adapted to arch over the cow's back and support said yoke in position beneath the cow's birth canal; an inner tubular element extending rearwardly from a point of attachment intermediate the ends of the yoke, said element including a slot in the underside thereof opening onto its rear end; an outer tubular element telescoped over the inner tubular element and cooperating therewith to define a rigid post movable between a retracted and an extended position; a first pulley mounted in the rear end of the outer tubular element for rotation about a transverse axis; a second pulley mounted within the bottom of the outer tubular element for rotation within the slot in the inner tubular element about a vertical axis; a winch frame including a sleeve mounted on the outer tubular element for longitudinal slidable movement between the ends thereof, said frame including means for attaching an obstetrical chain thereto and a pair of upstanding transversely spaced supports; a crank-operated winch drum mounted between the spaced supports of the winch frame for rotational movement about a transverse axis; and, a winch cable wound upon the winch drum having one end anchored at a point forward of the outer tubular element that remains fixed with

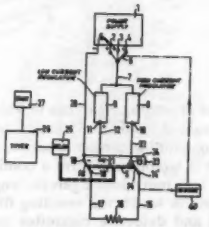


respect to the yoke and the other end anchored inside the outer tubular element adjacent the rear end thereof, the section of said cable lying between the winch drum and the anchor point within the outer tubular element being reaved rearwardly over the first pulley then forwardly inside the post around the second pulley and finally forwardly again to said outer tubular element anchor point, said winch when located at the rear end of the post with the latter in extended position being operative upon actuation in a selected direction to first retract said post and then travel to the forward end thereof, and said winch being operative when at the forward end of the post upon actuation in the opposite direction to first travel to the rear end thereof and subsequently extend same thereby drawing a calf attached to the obstetrical chain from the birth canal of the cow.

3,955,583
METHOD OF AND APPARATUS FOR DENTAL ANESTHESIA

Roderich Horauf, 8073 Kosching, Germany

Filed Aug. 5, 1974, Ser. No. 495,069
Claims priority, application Germany, Aug. 4, 1973, 2339648
Int. Cl.² A61N 1/34
U.S. Cl. 128—420 R **10 Claims**



1. A method of dental anesthesia comprising the steps of:
applying to the region to be anesthetized a primary train of like equispaced direct-current primary voltage pulses of a polarity tending to counter nerve-generated pain signals; and

applying to said region in each of the intervals between said primary pulses a direct-current secondary voltage pulse of a polarity opposite to that of said primary pulses and a duration and current strength equal to a fraction of the duration and current strength of said primary pulses, said primary pulses having a duration and current strength equal to between three and 20 times the duration and current strength of said secondary pulses.

5. An apparatus for dental anesthesia comprising:

a primary constant current source having a primary output with a primary current strength;

a secondary constant current source having a secondary output with a secondary current strength equal to a fraction of said primary current strength;

switch means having one side connectable to a region to be anesthetized and another side alternately connectable to said primary and secondary outputs for alternately applying to said region a primary voltage pulse of a polarity tending to counter nerve-generated pain signals from said primary current source and a secondary voltage pulse of opposite polarity from said secondary current source;

clock means connected to said switch means for alternately connecting said another side thereof for a predetermined primary time period to said primary current source and for a predetermined secondary time period equal to a fraction of said primary time period to said secondary current source; and

a voltage source connected in common to both of said current sources.

3,955,584

TOBACCO RECLAIMING APPARATUS IN CIGARETTE MAKING

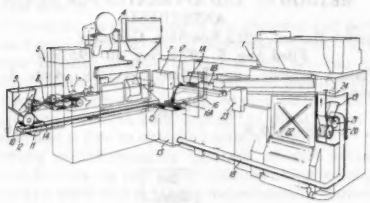
Desmond Walter Molins, and Eryk Stefan Doerman, both of London, England, assignors to Molins Limited, London, England

Filed July 3, 1974, Ser. No. 485,680

Claims priority, application United Kingdom, July 12, 1973, 73/33261

Int. Cl.² A24C *1/04*

U.S. Cl. 131—96 **6 Claims**



1. In the method of making cigarettes in which a continuous tobacco filler stream is formed and is trimmed to remove a portion thereof constituting surplus tobacco, and the remaining part of which is wrapped to form a continuous cigarette rod which is cut into individual cigarette lengths and united with filter tips, and in which the resulting filter tipped cigarettes are tested and defective cigarettes are rejected, the improvement comprising the steps of stripping tobacco from the rejected cigarettes to form an irregular flow of waste tobacco, collecting further particles from the uniting of such cigarette lengths and filter tips, adding the collected further particles to said irregular flow of waste tobacco, reducing variations in the rate of said irregular flow, and feeding said flow at a controlled rate to said remaining part of the filler stream which is not trimmed during the trimming operation.

3,955,585

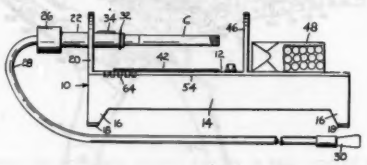
SAFETY SMOKING DEVICE

Alvin F. Fox, 404 SW. Bay Blvd., Newport, Oreg. 97365

Continuation of Ser. No. 425,155, Dec. 17, 1973, abandoned. This application May 12, 1975, Ser. No. 576,427

Int. Cl.² A24F *13/14*

U.S. Cl. 131—186 **4 Claims**



1. A safety smoking device arranged to permit a person to smoke a cigarette but to prevent such person from having access to such cigarette, such device comprising,

a. a casing having a bottom wall and enclosing side, end and top walls,

b. support means on said casing for seating it on a supporting surface in its use,

c. said bottom wall having an aperture adjacent one end of the casing,

d. flanged ashtray means seated on said bottom wall in depending relation in said aperture,

e. cigarette holding means mounted in an end wall of said casing which is adjacent said aperture for the ashtray means,

f. said cigarette holding means being arranged to hold a cigarette over said ashtray means,

g. means locking said cigarette holding means in said end wall so as to be non-removable by the smoker,

h. said cigarette holding means having an end portion thereof projecting outwardly of said casing,

i. a flexible tube mounted at one of its ends on said projecting end of said cigarette holding means,

j. a smoking tip on the other end of said flexible tube,

k. said casing including a lid forming a part of said enclosing walls,

l. and key operated lock means in said lid arranged to lock it closed on said casing for preventing access to the interior of the casing by the smoker.

3,955,586

BUFFER TREATED POLYURETHANE FOAM END WRAP

Lloyd Bruce Hartsough, Green Township, Hamilton County, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 2, 1975, Ser. No. 562,287

Int. Cl.² A45D *7/00*

U.S. Cl. 132—7 **10 Claims**

1. An end wrap for use in the permanent waving process which comprises a permeable flexible wafer of open-celled polyurethane foam having a thickness of from about 1/16 inch to about 1/64 inch, an average pore incidence within the range of from about 30 to 120 pores per linear inch and, contained in said end wrap at a level of at least 5 milligrams of buffer per cubic inch of foam, a solid, water-soluble buffer system having a pH of from about 3 to about 6.

3,955,587

CHANGEABLE-SHAPE HAIR PIECE AND METHOD OF STYLING AN ARTIFICIAL COIFFURE

Ralph Dunn, Los Angeles; J. Stephen Lewis, Pacific Palisades, and Mellie M. Phillips, Los Angeles, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Sept. 28, 1972, Ser. No. 293,233
Int. Cl.² A41G 3/00
U.S. Cl. 132—53 21 Claims

1. A method of styling and maintaining freely flexible hair filaments in a predetermined curled dry arrangement, comprising the steps of:

dispersing throughout said hair filaments, in intermingled relation therewith, a plurality of separate ductile filaments;

coiling groups of said ductile filaments and said hair filaments into a coil which exceeds the elastic limit of each of said ductile filaments whereby each of said ductile filaments is deformed and exerts sufficient torque on at least a major portion of the hair filaments in a group to hold them in a curled dry arrangement; and

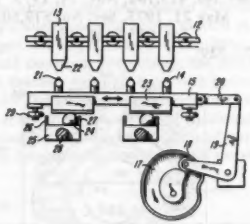
maintaining said coiled ductile filaments in said groups of hair filaments to hold them in said arrangement.

3,955,588

SPRAYING DEVICE FOR A BOTTLE CLEANING MACHINE

Gerhard Born, Bingen-Budesheim, Germany, assignor to Seitz-Werke GmbH, Bad Kreuznach, Germany

Filed July 11, 1974, Ser. No. 487,750
Claims priority, application Germany, July 12, 1973, 2335395
Int. Cl.² B08B 3/02, 9/08
U.S. Cl. 134—129 10 Claims



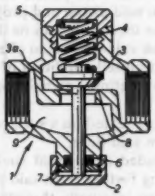
1. In combination with a bottle cleaning machine; conveyor means operable to support bottles in inverted position and longitudinally spaced relation while moving the bottles longitudinally, a frame beneath said conveyor means and having upwardly directed nozzles therein spaced in conformity to the spacing of the bottles on the conveyor means, support means supporting said frame for longitudinal movement of displacement to and fro during longitudinal shifting substantially parallel to the movement of said conveyor means, and axleless moving and guiding means for reciprocating said frame on said support means to cause said nozzles to follow respective bottles on said conveyor means in succession for a predetermined length of travel of the bottles on the conveyor means.

3,955,589

FLUID ISOLATING VALVE

Rodney Thomas Beazley, 19 Lancet Lane, Loose, Downderry, Maidstone, Kent, England

Filed June 3, 1974, Ser. No. 476,075
Int. Cl.² F16K 17/38
U.S. Cl. 137—75 1 Claim



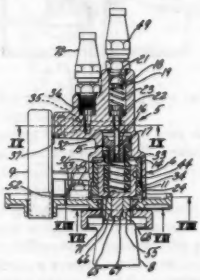
1. In a heat responsive emergency fluid isolating valve structure of the type comprising a valve casing provided with an inlet and outlet communicable through a valve opening including a valve seat within which is located a valve stem carrying a valve member at one end thereof cooperative with said seat and a compression spring cooperating with said valve seat and valve member for urging the latter to a closed position on said seat, the improvement wherein an internally threaded cap member made wholly from a material which fuses at the desired valve actuating temperature is screwed directly onto an externally threaded projecting part of said valve casing provided with a bore through which said valve stem is guided, said cap member engaging the opposite end of said valve stem which is entered into said cap member to hold the valve stem and valve member in the valve-open position against the counter action of said compression spring until the cap fuses and falls away.

3,955,590

REGULATOR FOR VEHICLE LEVELING SYSTEMS

Walter C. Palm, Grand Rapids, Mich., and James Lyon, Perrysburg, Ohio, assignors to Midland-Ross Corporation, Cleveland, Ohio

Filed Nov. 5, 1974, Ser. No. 521,053
Int. Cl.² G05D 16/10
U.S. Cl. 137—116.5 4 Claims



1. A fluid pressure regulator comprising:

a housing having a continuous elongate passageway defining an inlet port at one end and a control means receiving region at the other end, said passageway having a valve chamber adjacent to the inlet port, and a cylindricel piston chamber adjacent to said region, said chambers spaced and connected by an intermediate bore of lesser diameter than that of said chambers;

said housing having an exchange port in communication with said bore;

a first check valve means having a seat in the end of the valve chamber nearer said inlet port operable to admit fluid into the valve chamber;

a second check valve means having a seat in the end of the valve chamber further from said inlet port;

resilient means urging both check valve means to closed condition;

a valve body comprising a piston in circumferentially sealed slidable relation with said piston chamber, and a tube fixed coaxially to said piston and projecting through said bore at clearance therewith with its distal end seating on said second check valve means to effect sealed closure of said distal end at closed condition of the regulator;

said tube and piston defining an axial opening through said body;

a compression spring seated on a surface of said valve body facing away from said bore;

an externally threaded spring-seat socket fitting over the end of said spring further from said body;

a bushing having an internally threaded area surrounding said socket in threaded relation therewith with the outer surface of the bushing received in close-fitting relation with a lateral internal housing surface defining said region;

radially inwardly extending shoulder means located at at least one end of said internally threaded area limiting axial movement of the socket relative to the bushing;

means for adjusting the bushing to selected positions lengthwise of said passageway;

means for securing said bushing from rotation relative to said housing;

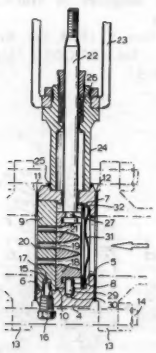
means for rotating said socket within said bushing to vary the length and compression of said spring.

3,955,591

INSERT TYPE SLIDING GATE VALVE

Hans D. Baumann, 548 Manville Road, Woonsocket, R.I. 02895

Filed Mar. 5, 1975, Ser. No. 555,361
Int. Cl.² F16K *11/06*
U.S. Cl. 137—270 **3 Claims**



1. Insert type sliding gate valve comprising:

a. a tubular housing;

b. one inlet and one outlet end formed in said housing, said inlet and outlet ends adapted to be coupled to pipeline flanges and to intermediate gaskets acting as sealing means between said inlet and outlet ends and said pipeline flanges;

c. a straight cylindrical passage formed in said housing and extending from the outlet end of said housing towards a shoulder near the other end of said housing providing at that point a reduced cross-section, said passage additionally having a slightly enlarged diameter portion near the outlet end, terminating in a stop shoulder within said housing, and further containing guiding means located at the lower part of said cylindrical passage;

d. a bonnet extending radially outward and being suitably connected at the upper extremity of said housing and containing within a reciprocating valve stem, the lower tip of which provides coupling means;

e. a circular plate slidingly engaged within the slightly enlarged diameter portion near the outlet side of said housing and having perpendicular extending parallel surfaces, one of which abuts the stop shoulder within said housing, while the opposite surface aligns with said outlet end of the housing, both of which engage one of said pipeline flange gaskets to effectively seal the interface between said slightly enlarged diameter portion of the housing and the outer diameter of said circular plate; said circular plate further having one or more horizontal passages formed therein, said passages being located on and in symmetric relationship to the horizontal axis of said circular plate;

f. a second movable plate having a flat plane surface which slidingly engages the perpendicular extending surface of said first circular plate, which abuts the stop shoulder within the housing, said movable plate being loosely confined within the cylindrical passage of said housing and having an external diameter which is reduced from the internal diameter of said cylindrical passage by a distance which slightly exceeds the vertical cross-sectional dimension of said passages within said first circular plate, said second plate having one or more horizontal passages formed therein at a location sufficiently transposed from the horizontal axis of the movable plate, so that the passages are in registry with the passages of said first plate when the external cylindrical surface of the movable plate is in contact with the inside wall surface of said cylindrical passage, said movable plate further being provided with a pair of identical coupling means located opposite to each other along the vertical axis of the plate to engage with said reciprocating valve stem on one end and with said guiding means on the other end;

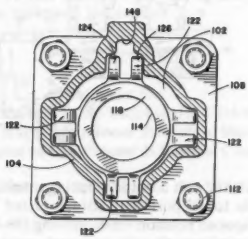
g. spring means retained within said housing and engaging and exerting a force against said movable plate.

3,955,592

CHECK VALVE

Glen B. Guyton, 3401 E. Newton, Tulsa, Okla. 74115

Division of Ser. No. 415,742, Nov. 14, 1973. This application May 21, 1975, Ser. No. 579,502
Int. Cl.² F16K *15/03*
U.S. Cl. 137—329 **2 Claims**



1. A check valve comprising a separable housing, inlet and outlet ports provided in the housing for flow of fluid through the valve, valve seat means provided in the housing, closure means pivotally secured within the housing and cooperating with the valve seat means to provide alternate open and closed

positions for the valve, hanger means provided in the housing for pivotally securing the closure member thereto, means cooperating between the hanger means and closure means to compensate for dimensional variances of the closure means and valve seat for assuring an efficient sealing of the valve in the closed position thereof, and wherein the hanger means comprises a plurality of sets of spaced arcuate fingers provided on the housing, said sets of arcuate fingers being circumferentially spaced with respect to the valve seat for selective orientation with respect to the closure means to provide said compensation for dimensional variances of the valve seat and closure means.

3,955,593

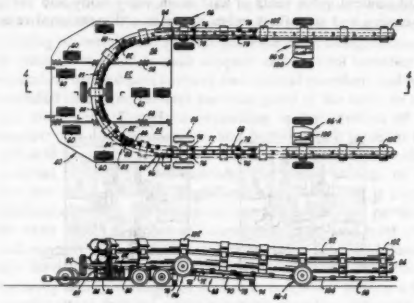
CONVEYOR FOR FLEXIBLE SLURRY HOSE

Ronald W. Umphrey, and David L. McCain, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Continuation of Ser. No. 463,222, April 23, 1974, abandoned. This application Apr. 4, 1975, Ser. No. 565,183

Int. Cl.² B65H *75/34*; B55G *53/30*

U.S. Cl. 137—344 **20 Claims**



1. In a system for transporting a slurry from a mining machine in a mine having a floor and which includes at least one, flexible hose supported by a plurality of spaced, wheeled carts, and further supported by a flexible linkage interconnecting the carts, which system further includes a mobile conveyor movably supporting some of the carts off the floor and a 180° bend in the hose and linkage, and located between the storage section and a parallelly located active section as the need for the hose changes, the improvement comprising:

means on said conveyor for guiding the linkage and hose supported thereon through a curving path defining said bend of 180°, which curving path includes a first portion having a radius of curvature which continually diminishes and a second portion having a radius of curvature which continually increases to complete said curving path.

3,955,594

PRESSURE OPERATED VALVE SYSTEMS

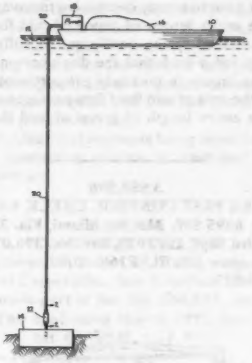
Richard K. Snow, Houston, Tex., assignor to Raymond International Inc., Houston, Tex.

Filed Feb. 25, 1974, Ser. No. 445,356

Int. Cl.² F16K *15/14*

U.S. Cl. 137—493 **10 Claims**

1. A pressure responsive valve comprising a fluid conduit including along its length a flexible sleeve, a compressible elastic material surrounding said sleeve and holding its central region in a normally pinched closed condition, and a rigid outer casing surrounding said elastic material and isolating said elastic material from all pressure effects other than effects of fluid pressure applied through said sleeve from within said conduit, said rigid outer casing being permanently closed to



prevent movement of said elastic material into or out from said casing.

3,955,595

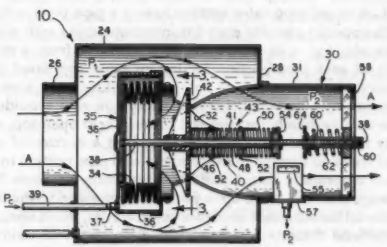
AUTOMATIC FLUID FLOW REGULATOR

Edward E. Modes, Deerfield, Ill., assignor to Powers Regulator Company, Skokie, Ill.

Continuation-in-part of Ser. No. 416,202, Nov. 15, 1973, abandoned. This application Mar. 25, 1974, Ser. No. 454,720

Int. Cl.² G05D *7/00*; F24F *11/04*

U.S. Cl. 137—517 **3 Claims**



1. A device for regulating the airflow rate in an air distribution system comprising:

a housing having two ends, one end defining an air inlet passageway and a second end sealably engaging a discharge duct, said duct having a lateral wall with at least one aperture therein;

flow restricting means mounted within said duct adjacent said aperture and axially displaceable therein in response to pressure differentials between the portions of the air in said distribution system upstream and downstream from said regulating device, said flow restricting means including an axially extending shaft and a piston slideably mounted on said shaft and axially displaceable coincident with said aperture in response to said pressure differentials;

spring means mounted on said shaft downstream from said piston and having a predetermined non-linear coefficient of stiffness for yieldably resisting the downstream displacement of said flow restricting means;

said aperture and said flow restricting means together comprising means for forming a variable area airflow passageway through which substantially all the air must flow in passing through said regulating device; and

said aperture having a size and shape including axial continuity and a continuously decreasing transverse dimension along the entire length of travel of said flow restricting means, and said spring coefficient of stiffness having a non-linear value such that the displacement of said flow restricting means is inversely proportional to the logarithm of the area of said fluid flow passageway continually along the entire length of travel of said flow restricting means.

3,955,596

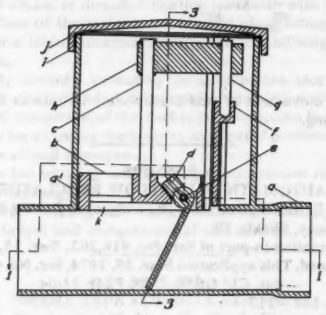
SEWER PEST CONTROL CHECK VALVE

Benigno Diaz, 6595 SW. 31st St., Miami, Fla. 33155

Filed Sept. 10, 1973, Ser. No. 396,071

Int. Cl.² F16K *15/03*

U.S. Cl. 137—527 **4 Claims**



1. A sewer pipe valve section having a pipe portion formed with opposite circular ends for interconnecting with adjacent pipe sections, a housing extending upwardly from a midportion of said pipe portion having an open top fitted with a removable cover and an interior shoulder at a lower end thereof, a valve support frame resting on said shoulder and movable vertically for removal through said open top, a one-way flapper valve pivotally mounted on a horizontal axis in said frame to depend therefrom into said pipe portion to swing from a normally closed position obstructing a reverse flow of sewage material to an open position responsive to the flow of material downstream toward a sewer outlet, a rod upstanding from said frame, a screen spaced upstream of said valve mounted in said housing for vertical movement from a normally raised inoperative position within the housing to a lowered operative position in said pipe portion, and disengageable linkage means coacting between said rod and said screen to secure said screen in said raised inoperative position when said frame is resting on said shoulder and to be disengaged to release said screen for lowering into said operative position when said frame and valve are removed for cleaning the pipe.

3,955,597

POPPET TYPE CHANGE-OVER VALVE ASSEMBLY

Naotake Oneyama, and Hidetsuugu Fujitani, both of Soka, Japan, assignors to Shoketsu Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 5, 1974, Ser. No. 521,141

Claims priority, application Japan, Nov. 7, 1973, 48-125143

Int. Cl.² F16K *11/00*

U.S. Cl. 137—625.25 **19 Claims**

1. A poppet type change-over valve assembly for switching a direction of a fluid flow, comprising:

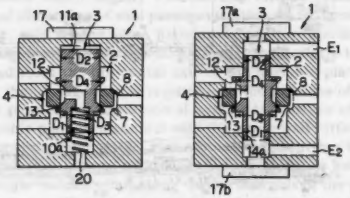
a valve casing interiorly defining a generally cylindrical valve chamber and having valve guiding cavities at opposite ends thereof and a pair of opposingly disposed conical valve seats intermediate said cavities; said casing comprising a plurality of parts which communicate between said valve chambers and the casing exterior, including an input port disposed in said casing intermediate said casing's conical valve seats, a pair of output ports disposed in said casing on opposite sides of said casing's conical valve seats, and an exhaust port;

a main valve body slidably received in said valve chamber and having slide end portions in hermetical engagement with walls of said valve guiding cavities of said valve casing and a pair of opposingly disposed conical valve seats provided between said sliding end portions in face to face relation with said conical valve seats of said valve casing;

means communicating said outlet ports through said valve body with said exhaust port;

an annular float valve loosely mounted around said main valve body between said opposingly disposed conical valve seats of said valve casing and of said main valve body, said float valve having concentric outer and inner sealing edges for engagement with said conical valve seats of said valve casing and said main valve body;

said conical valve seats of said main valve body and valve casing and said float valve being in a dimensional relationship dictated by an inequality $\psi° < 180° - \theta° < \phi°$ (wherein $\psi°$ is a cone angle defining the conical valve seats of said main valve body, $\phi°$ is a cone angle defining the conical valve seats of said valve casing and $\theta°$ is a cone angle containing two diagonally positioned sealing edges of said float valve);



a valve biasing means for urging said main valve body to assume a first change-over position wherein said float valve is tightly held between one of said conical valve seats of said main body valve and said facing conical valve seat of said valve casing; and

a valve operating means provided at one end of said valve casing for shifting said main valve body against the action of said valve biasing means into a second change-over position wherein said float valve is tightly held between the other of said conical valve seats of said main body valve and the other of said facing conical valve seats of said casing;

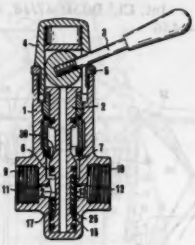
said float valve thus being tightly held between said conical valve seats of said main valve body and said valve casing by the action of said main valve body and a fluid pressure prevailing in said valve chamber when said main valve body is shifted to either said first or second change-over position, establishing a tight seal around said main valve body thereby communicating a selected one of said output ports with said input port while draining another one of said output ports though said exhaust port in said valve casing.

3,955,598

DISTRIBUTING MEMBER HAVING A RESILIENTLY BACKED LAMELLAR SKIRT, FOR MIXING VALVES

Alfons Knapp, Bleicherstrasse, Biberach an der Riss, Germany

Filed Apr. 15, 1974, Ser. No. 461,099
Claims priority, application Italy, May 11, 1973, 68343/73
Int. Cl.² F16K 11/02, 5/18
U.S. Cl. 137—625.41 7 Claims



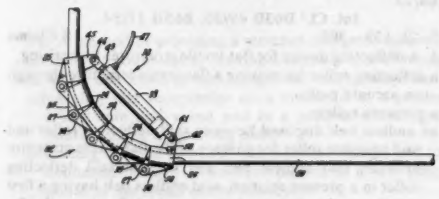
1. A distributing member for mixing valves having inlet ports, comprising a support and control member, a peripherally interrupted flexible lamellar skirt made of a resiliently yielding material, said flexible lamellar skirt being connected at least at one end to said support and control member and extending around said support and control member, and being intended to cooperate with the inlet ports of the valve to open and close said inlet ports according to the position of said support and control member, and between said lamellar skirt and said support and control member a compressed resilient material, extending substantially the entire extent of said lamellar skirt, whereby a resilient backing action is exerted substantially onto the whole surface at least of that portion of the skirt which is active in cooperating with said inlet ports, said support and control member having a seat, said lamellar skirt having at one end a collar that encloses said seat, and the mutually facing surfaces of said seat and collar having a non-circular shape forming a non-rotatable coupling, whereby said lamellar skirt can be mounted onto said control member in different positions always being prevented from rotating with respect to said control member.

3,955,599

APPARATUS FOR BENDING A FLOWLINE UNDER SUBSEA CONDITIONS

Raymond W. Walker, Huntington Beach, Calif., assignor to Deep Oil Technology, Inc., Long Beach, Calif.

Division of Ser. No. 402,058, Oct. 1, 1973, Pat. No. 3,893,305. This application Jan. 2, 1975, Ser. No. 537,838
Int. Cl.² F16L 55/00
U.S. Cl. 138—103 11 Claims



1. A pipe bending means for a subsea flowline having a flowline axis, comprising:

a plurality of cylindrical segments in spaced apart axial tandem relation adapted to be loosely ensleeved over said flowline and including end cylindrical segments;

first means pivotally interconnecting adjacent ends of said cylindrical segments along an external line spaced from and laterally paralleling said flowline axis;

second means pivotally interconnecting said end cylindrical segments along an external line diametrically opposite in respect to said flowline axis to said first external line;

said second pivotal interconnecting means including a cylinder and piston means;

and actuating means for the cylinder and piston means to move each segment about its pivotal connection to adjacent segments to bend said flowline about said flowline axis into a preselected arc,

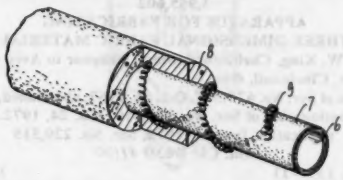
said spaced cylindrical segments being moved into angularly disposed contacting relation to limit said bend to said preselected arc.

3,955,600

COMPOSITE PIPELINE

Russell D. Tamburello, Daly City, Calif., assignor to Bechtel International Corporation, San Francisco, Calif.

Continuation-in-part of Ser. No. 150,633, June 7, 1971, abandoned. This application May 8, 1973, Ser. No. 358,326
Int. Cl.² F16L 9/14, 9/18
U.S. Cl. 138—141 10 Claims



2. A composite pipeline comprising an elongate, cylindrical, load bearing steel pipe, at least one layer of glass fibers bonded to the entire outer surface of the steel pipe, a layer of structural adhesive bonded to the entire outer surface of the glass fibers, and a thick layer of load bearing, reinforced concrete cast in place directly on the layer of adhesive around the pipe, said layer of concrete having a thickness several times as thick as the thickness of the steel pipe, and said pipe, said layer of adhesive, said layer of glass fibers and said layer of concrete all integrally bonded together, thus resulting in an integral, composite pipeline of substantial strength and load bearing ability.

3,955,601

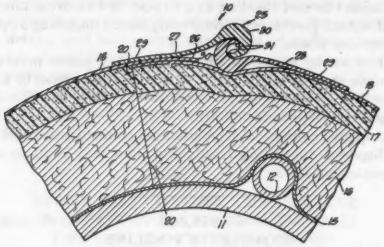
HEAT INSULATING JACKET FOR A CONDUIT EQUIPPED WITH SELF-LOCKING SEAM

Walter A. Plummer, III, Tempe, Ariz., assignor to Moore Business Forms, Inc., Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 310,257, Nov. 29, 1972, Pat. No. 3,925,856. This application Apr. 7, 1975, Ser. No. 565,623
Int. Cl.² F16L 9/14, 9/00
U.S. Cl. 138—149 4 Claims

1. A heat insulating tubular jacket for snug assembly about a conduit of the type embraced by heat tracer tubing, said jacket comprising a unitary laminated assembly including an impervious flexible relatively thin outer layer, at least one relatively thick resilient layer of heat insulating material, and an inner layer of relatively thin ductile heat conductive material adapted to lie flush against a conduit and the juxtaposed surface of heat tracer tubing embracing the conduit when said tubular jacket is snugly assembled thereabout, interengaging seam forming members of extruded plastic material secured along the opposite laternal edge portions of said flexible outer layer of said jacket having edge portions shaped to internest when overlapped with one another after said jacket has been snugly assembled about a conduit, and said jacket and the resiliency of said heat insulating material being adapted and

effective to hold said heat conductive layer pressed firmly against the heat tracer tubing and the exterior of the conduit



thereby to distribute heat from the tracer tubing to portions of the conduit spaced to either lateral side of the tracer tubing.

3,955,602

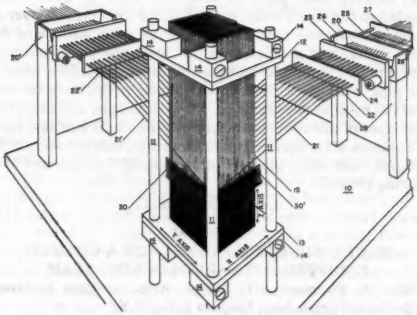
APPARATUS FOR FABRICATING THREE-DIMENSIONAL FABRIC MATERIAL

Robert W. King, Chelmsford, Mass., assignor to Avco Corporation, Cincinnati, Ohio

Division of Ser. No. 675,367, Oct. 16, 1967, abandoned, which is a continuation of Ser. No. 220,510, Jan. 24, 1972. This application Jan. 24, 1972, Ser. No. 220,515

Int. Cl.² D03D *41/00*

U.S. Cl. 139—11 **1 Claim**



1. Apparatus for fabricating a three-dimensional material comprising:

a. means for orienting a cluster of filaments in a direction defining the Z axis and adapted to space such filaments in intersecting rows lying in directions defining the X axis and Y axis of the cluster,

b. a first plurality of needles positioned adjacent said Z axis filaments orienting means and adapted to weave courses of filaments into the Z axis filaments along the X axis of said filaments,

c. a second plurality of needles positioned adjacent said Z axis filaments orienting means and adapted to weave courses of filaments into the Z axis filaments along the Y axis of said filaments, and

d. said Z axis filaments orienting means and said first and second pluralities of needles being sized and positioned to weave each of such filaments in close touching contact with each adjacent filament.

3,955,603

LOOMS PROVIDED WITH MEANS FOR MAKING MOVEMENT THEREOF UNIFORM

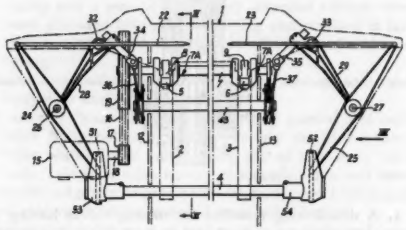
Francois Martelli, Zillisheim, France, assignor to Societe Alsacienne de Constructions Mecaniques de Mulhouse, Mulhouse Cedex, France

Filed July 30, 1974, Ser. No. 493,666

Claims priority, application France, Aug. 23, 1973, 73.30541

Int. Cl.² D03D *47/18, 49/60*

U.S. Cl. 139—446 **9 Claims**



1. A loom comprising an oscillatory sley, a driving shaft, activating means imparting to said sley from said driving shaft, a to-and-fro movement, a crank rotatable by said driving shaft, a connecting rod having a crank end and a cross-head, said crank end being articulated to said crank, and means compelling said cross-head of said connecting rod to describe a perceptibly rectilinear path, said connecting rod directly carrying an additional mass whereby the moment of inertia of said connecting rod introduces inertial variations led back to said driving shaft which are opposed to and of absolute values at most equal to the inertial variations due to the full sley motions and the motions of said activating means likewise led back to said driving shaft.

2. The loom as set forth in claim 1, including weft inserters, and activating means imparting to said weft inserters from said driving shaft a to-and-fro movement, whereby the moment of inertia of said connecting rod introduces inertial variations led back to said driving shaft which are opposed to and of absolute values at most equal to the inertial variations due to the combined sley and inserter motions and the motions of all said activating means likewise led back to said driving shaft.

3,955,604

DEFLECTING DEVICE FOR FLAT TEXTILE STRUCTURES

Rudolf Braun, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed June 18, 1974, Ser. No. 480,574

Claims priority, application Switzerland, June 22, 1973, 9164/73

Int. Cl.² D03D *49/20*; B65H *17/34*

U.S. Cl. 139—308 **8 Claims**

1. A deflecting device for flat textile structures comprising

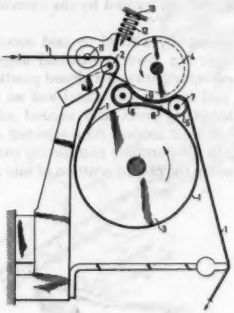
a deflecting roller for moving a flat textile structure through an arcuate path;

a pressure roller;

an endless belt disposed between said deflecting roller and said pressure roller for passage of the flat textile structure between said endless belt and at least said deflecting roller in a pressed relation, said endless belt having a first run disposed in facing relation to said deflecting roller for passage of the textile structure therebetween and a second run disposed in facing relation to said pressing roller, said second run being disposed under a pressing force from said pressing roller to press said first run towards said deflecting roller; and

a pair of rod-like reversing elements freely mounted within said endless belt, each element being disposed on an opposite side of a plane passing through the axes of rotation of said deflecting roller and said pressing roller.

4. In a weaving machine for flat textile cloth; a cloth take-off roller for taking-up a woven cloth, an endless belt having



a first run disposed in facing relation to said take-off roller for passage of the cloth therebetween and a second run opposite said first run, and a pressing roller disposed in facing relation to said second run for pressing said second run towards said first run to bias said first run against said take-off roller to press the cloth therebetween.

3,955,605

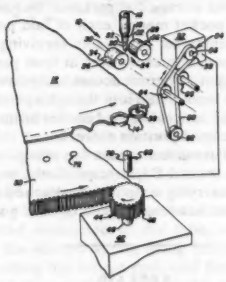
APPARATUS AND METHOD FOR SUPPLYING A METERED CHARGE AT ANY FEED RATE

Norbert M. Zupan, Crawfordsville, Ind., assignor to H-C Industries, Inc., Crawfordsville, Ind.

Filed Feb. 27, 1975, Ser. No. 553,527

Int. Cl.² B65B *3/04*

U.S. Cl. 141—1 R **12 Claims**



12. A method of providing a metered charge of material to a plurality of continuously moving uniformly spaced receptacles which can travel at varying speeds, which comprises:

advancing said receptacles on a conveyor at a predetermined rate and speed and in a predetermined spaced relation along a receiving path,

providing material to be cut into metered charges and to be deposited in each of said receptacles at a rate proportional to the speed of the conveyor,

cutting said material into metered charges by a cutting means at a frequency proportional to the speed of the conveyor, and

intermittently actuating said cutting means at a frequency directly proportional to the rate of supply of receptacles to said conveyor so that said cutting means has a cutting velocity independent of the speed of said conveyor and of the frequency of operation of said cutting means.

3,955,606

LOADING CONTAINERS WITH POWDER

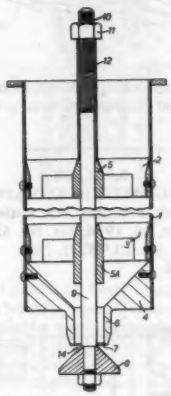
John Joseph Dunkley, Putnoe, England, assignor to Davy International Limited, London, England

Filed Nov. 7, 1974, Ser. No. 521,766

Claims priority, application United Kingdom, Nov. 14, 1973, 52885/73

Int. Cl.² B65B *1/04*

U.S. Cl. 141—12 **5 Claims**



1. A process for loading a vertically oriented cylindrical container with metal powder comprising first particles and second particles finer than said first particles so that the second particles form an outer layer surrounding the first particles, said process comprising the steps of:

a. inserting means defining a delivery zone into the container so that said zone is coaxial with the container and spaced from the bottom thereof,

b. feeding said metal powder comprising both said first and second particles out of the lower end of said delivery zone into the container in the form of a free-falling diverging continuous curtain of circular plan in horizontal cross-section, and

c. maintining the delivery zone and the container so positioned relative to one another during the feeding step that the diverging curtain of powder always strikes the side wall of the container and said first particles rebound further from said side wall than said finer second particles.

3,955,607

MITERING GUIDE FOR ROTARY POWER TOOL

Edward N. Roche, 5 Hickory Hill Road, Cockeysville, Md. 21030

Filed Mar. 3, 1975, Ser. No. 554,962

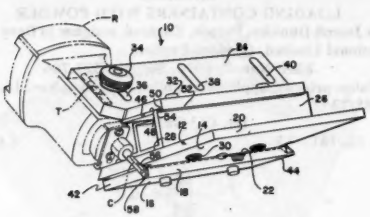
The portion of the term of this patent subsequent to Oct. 21, 1992, has been disclaimed.

Int. Cl.² B27C *5/10*

U.S. Cl. 144—134 D **14 Claims**

1. A guide for a rotary power tool having an endmill type elongate cutter for mitering a laminate disposed on a substrate, comprising: a plate having top and bottom surfaces and left, right, front and rear edges, a guide strip rearwardly disposed on the bottom of said plate and having a guiding edge facing said front edge with a coextensive recess in the guiding edge proximate the bottom of said plate for receiving laminate therebetween while guiding on said a substrate, and means for

holding said a rotary power tool at an angle to said plate and guide strip with the cutter passing downwardly and forwardly through said recess, including means for adjustably positioning said cutter at respective predetermined locations tangent with either end of said plate and guide strip and intermediately between said ends.



3,955,608

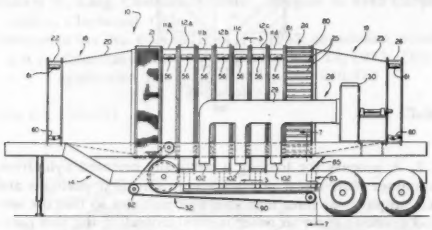
DEBARKING METHOD AND APPARATUS

Raimond J. Smiltneek, P.O. Box 273, Butler, Wis. 53007

Filed Dec. 16, 1974, Ser. No. 532,895

Int. Cl.² B27L *1/00*

U.S. Cl. 144—208 B **34 Claims**



1. Apparatus for debarking wood sections comprising, a plurality of individually rotatable, hollow and interconnected housing sections defining an impact zone, said sections each being mounted for rotation about gennerally horizontal axes,

drive means for simultaneously rotating a first group of said housing sections in a first direction and a second group of said housing sections in an opposite direction,

a plurality of unconnected impact means each having higher specific gravity than the wood sections to be debarked and being disposed within said impact zone, and

means disposed on the internal surface of at least some of said housing sections for elevating said plurality of impact objects within said impact zone a distance substantially above the axis of rotation of said housing section and for releasing the same for random impacting engagement with the wood sections whereby the bark on said sections is removed.

3,955,609

HANDBAG

Milton I. Siegel, Scottsdale, Ariz., assignor to AMBA Marketing Systems, Inc., Tempe, Ariz.

Filed Sept. 16, 1975, Ser. No. 613,896

Int. Cl.² A45C *3/06*, *1/08*

U.S. Cl. 150—35 **5 Claims**

1. A handbag comprising:

a body having first and second side panels joined to bottom and end panels to form a compartment,

a first flap hingedly affixed to said first side panel substantially near the upper horizontal edge thereof and movable between a closed position in juxtaposition with said first side panel and an open position extending angularly from said first side panel, said first flap having dimensions selected to cause said first flap to substantially completely overlie said first side panel in said closed position of said first flap,

first storage compartment means on at least one of the outside of first side panel or said first flap on the side thereof adjacent said first side panel,

external storage means carried by the exterior side of said first flap,

a second flap hingedly affixed to said second side panel substantially at the lower horizontal edge thereof and selectively movable between a closed position in juxtaposition with said second side panel and an open position extending angularly from said second side panel, the dimensions of said second flap selected to cause said second flap to substantially completely overlie said second side panel in the closed position of said second flap,

second storage compartment means on at least one of the outside of said second side panel or said second flap on the side thereof adjacent said second side panel,

said first or second storage compartment means comprising a plurality of pocket means, each of said pocket means having an opening for removably receiving documents therein, said pocket means being at least partially offset from one another to permit access to documents therein whenever said second flap is in the open position thereof, said second flap concealing said pocket means where said flap is in the closed position thereof,

first and second retention means for selectively retaining said first and second flaps, respectively, in said closed position, and carrying strap means attached to said body for carrying the handbag in hand or over a shoulder.

3,955,610

SELF-SEATING TIRE TRACTION APPARATUS FOR CLAMPINGLY ENGAGING TIRE SIDEWALLS

Marshall E. Freeman, 1305 Camino Pablo, San Jose, Calif. 95125

Filed Apr. 28, 1975, Ser. No. 572,078

Int. Cl.² B60C *27/06*, *27/14*

U.S. Cl. 152—213 A **11 Claims**

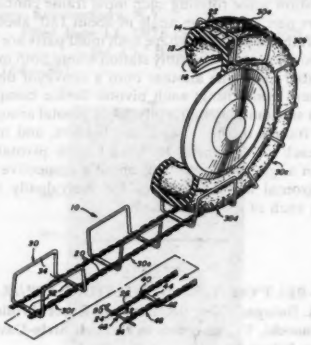
1. A tire traction apparatus for use on a tire comprising:

at least one chain having first and second ends and a length slightly greater than the circumference of the tire;

means for securing said first end to a portion of said chain proximate said second end; and

a plurality of spaced-apart generally U-shaped members each including a tire tread engaging base portion affixed to said chain such that said chain is adapted to engage the road-engaging surface of the tire tread and a pair of opposed tire sidewall engaging portions, said chain serv-

ing to provide improved traction on ice, said base portion serving to provide traction on snow and said tire sidewall



engaging portions serving to maintain said chain on the tread.

3,955,611

AWNING CONSTRUCTION

John W. Coles, Dolton, and Dean F. Kneips, Chicago, both of Ill., assignors to C & K Sales Corporation, Dolton, Ill.

Filed Aug. 5, 1970, Ser. No. 61,329
Int. Cl.² E04F *10/06*
U.S. Cl. 160—67 4 Claims

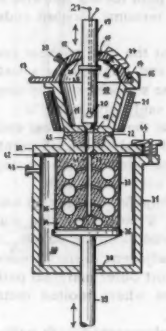
1. An awning construction comprising, a pair of support arms, each of said arms having one end adapted for attachment to a mobile home, a torque rod having opposite ends non-rotatably connected to the other end of each of said arms, a spring having one end non-rotatably connected to the torque rod, a tube rotatably mounted on the torque rod and being non-rotatably connected to the other end of the spring, a second spring having one end connected to the torque rod and the other end connected to the tube, said first-mentioned spring and the second spring being helically wound springs and surrounding the torque rod, said first-mentioned spring being wound in one direction and the second spring being wound in the opposite direction to provide a balanced torque between the tube and the torque rod, a lock for releasably locking the tube to the torque rod to prevent rotation therebetween, an awning shade having one end secured to the tube and the opposed end secured to the wall of the mobile home, said tube having an elongated box along its length having a slot therein for receipt of one end of the awning shade for connecting the awning shade to the tube, and a pair of bearings mounted in opposite ends of the tube for rotatably engaging the torque rod, a pair of spring-to-rod fasteners slideably mounted on the torque rod in non-rotating engagement with the torque rod, each of said spring-to-rod fasteners being connected to one end of each of the springs, a pair of spring-to-tube fasteners slideably mounted in the tube and non-rotatably engaging said tube, each of said spring-to-tube fasteners being fixed to the other end of each of the springs, and a pair of trim caps non-rotatably engaging opposite ends of the rod.

3,955,612

METAL MELTING AND CASTING PROCESS

Alfons Schultheiss, Grenzweg 9, 7541 Salmbach, Pforzheim, Germany

Filed June 19, 1974, Ser. No. 480,854
Int. Cl.² B22D *27/16*
U.S. Cl. 164—62 3 Claims



1. A method of producing finely branched casting of metal and metal alloys, such as jewelry castings of precious metal alloys, for example, the method comprising the steps of:

arranging a hermetically closable crucible above a mold enclosed within a hermetically closable receptacle, with a valve-closable tapping channel leading from the bottom of the crucible to the mold sprue;

applying to the receptacle a negative pressure, thereby evacuating from the mold cavity a substantial portion of the gas contained therein;

melting in the crucible a charge of casting metal, while pressurizing the closed crucible with a gas; and

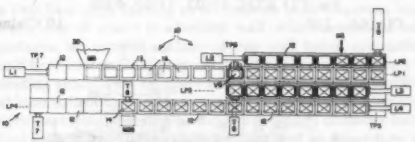
tapping the melted charge from the pressurized crucible into the partially evacuated mold, by opening the valve of the tapping channel.

3,955,613

FOUNDRY MOLD CONVEYOR SYSTEM

Robert S. Lund, Elmhurst, Ill., assignor to Pettibone Corporation, Chicago, Ill.

Filed Feb. 3, 1975, Ser. No. 546,266
Int. Cl.² B22D *5/04*
U.S. Cl. 164—130 19 Claims



5. A foundry mold conveyor system designed for the intermittent indexing movement of mold supporting pallets and comprising:

a. means defining a relatively long first longitudinal path for the forward step-by-step indexing movement of pallets therealong,

b. means disposed alongside said first path and defining a relatively short second contiguous outer marginal longitudinal path for the step-by-step forward indexing movement of pallets therealong,

c. means disposed alongside said first path and defining a relatively short third contiguous inner longitudinal path

for the step-by-step rearward indexing movement of pallets therealong,

d. means disposed alongside said third inner path defining a relatively long fourth contiguous outer marginal longitudinal path for the step-by-step rearward indexing movement of pallets therealong,

e. means disposed at the extreme forward end of said first, second, third and fourth paths and establishing a fifth and transverse pallet path for the sidewise indexing of pallets issuing from the terminal forward ends of said first and second paths,

f. means disposed at the extreme rear ends of said second and third paths and establishing a sixth and transverse pallet path for the sidewise step-by-step indexing of pallets issuing from said third path,

g. means disposed at the extreme rear ends of said first and fourth paths and establishing a seventh and transverse pallet path for the sidewise step-by-step indexing of pallets issuing from said fourth path,

h. means disposed adjacent to the rear end of said first path and establishing a mold-receiving station where fresh molds are delivered to empty pallets,

i. means disposed adjacent to the forward end of said second relatively short outer marginal path and establishing a pouring station where molten metal is poured into palletized molds,

j. means disposed along said fourth path intermediate said sixth and seventh paths and establishing a mold discharge station where mold-encased castings are discharged from the pallets,

k. said first and sixth paths defining an intersection establishing a jacket transfer station where mold jackets are removed from poured jacketed molds and are applied to fresh palletized molds,

l. means disposed at said jacket transfer station for effecting the jacket transfer operations,

m. respective longitudinal cylinders effective to index the pallets in each of the first, second, third, and fourth longitudinal paths one pallet length at a time,

n. respective transverse cylinders effective to index the pallets in each of the sixth and seventh transverse rows one pallet width at a time, and

o. a transverse cylinder effective to index the pallets in the fifth transverse row two pallet widths at a time.

3,955,614

FOUNDRY MOLDING MACHINE

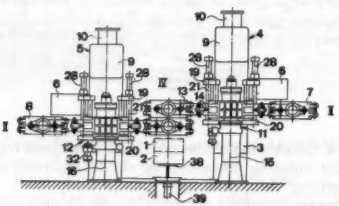
Werner Geiger, Meggen, Switzerland, assignor to Inventio AG, Hergiswil, Switzerland

Filed July 7, 1975, Ser. No. 593,452

Claims priority, application Switzerland, July 10, 1974, 9490/74; June 18, 1975, 7895/75

Int. Cl.² B22C *15/02, 13/02, 9/00*

U.S. Cl. 164—210 **10 Claims**



1. A foundry molding machine comprising two mold units, each of the mold units being provided with a respective match plate support and a sand filling- and compaction station for the separate simultaneous fabrication of two foundry mold parts, one of the mold parts defining a mold-lower part and the other mold part a mold-upper part, each of the mold units comprising a respective pivotal device possessing pivotal arms which are pivotable about substantially vertical axes in a respective substantially horizontal plane, said pivotal arms being provided with mold frame holders for supporing mold frames which can be rotated from the sand filling- and compaction station while rotating each mold frame containing the mold-lower part through an angle of about 180° about a horizontal shaft into a position where both mold parts are in superimposed position at an assembly station where both mold parts are deposited upon one another onto a conveyor device, the improvement comprising: each pivotal device comprising at least three substantially uniformly offset pivotal arms carrying the mold frames in the mold frame holders, and means for rotating each of the mold frames of both pivotal devices through an angle of about 180° about a respective substantially horizontal axis and means for individually vertically displacing each of the mold frames.

3,955,615

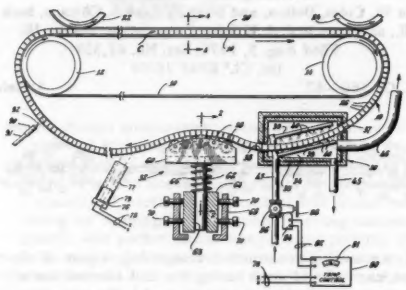
TWIN-BELT CONTINUOUS CASTING APPARATUS

John M. A. Dompas, Olen, Belgium, and Robert William Hazelett, Winooski, Vt., assignors to Hazelett Strip-Casting Corporation, Winooski, Vt.

Division of Ser. No. 401,703, Sept. 28, 1973, Pat. No. 3,865,196. This application Nov. 11, 1974, Ser. No. 522,334

Int. Cl.² B22D *11/06*

U.S. Cl. 164—278 **15 Claims**



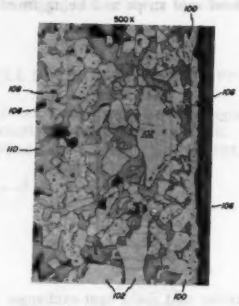
1. In a twin-belt continuous metal casting machine wherein two spaced side dams revolve in loops passing along opposite sides of a casting zone from its input end to its output end between a pair of revolving casting belts to define a moving mold and wherein the revolving side dams return from the output end to the input end of the casting zone along return paths which are located away from the casting zone, the invention comprising a pair of side dams each including a flexible metal strap loop having a multiplicity of slotted damblocks strung onto said strap, said damblocks on each strap being free to slide longitudinally with respect to the strap, deflecting means being positioned to engage against the respective side dams travelling along said return paths for deflecting the side dams along smoothly curved path sections convex toward the interior of the respective side dam loops, said convex path sections having sufficient convexity for forcing wedge-shaped spaces to occur between the adjacent ends of the damblocks on said convex path sections for tightening the damblocks together in abutting end-to-end relationship along opposite sides of said casting zone to ensure that the metal casting is formed without burrs on the sides adjacent to the side dams.

3,955,616

CERAMIC MOLDS HAVING A METAL OXIDE BARRIER FOR CASTING AND DIRECTIONAL SOLIDIFICATION OF SUPERALLOYS

Michael F. X. Gigliotti, Jr., Scotia, and Charles D. Greskovich, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed June 11, 1975, Ser. No. 586,025
Int. Cl.² B22C 9/02
U.S. Cl. 164—361 **17 Claims**



1. A mold suitable for the casting and directional solidification of superalloys therein including:

a shell comprising a material of a first refractory oxide bonded together by silica and having walls defining a cavity therein;

a barrier layer comprising a second refractory oxide disposed within the mold in integral contact with the first refractory oxide material;

the barrier layer having a surface defining at least a portion of the interior wall surfaces of the cavity into which the superalloy is cast and comes into contact therewith, and

the microstructure of the mold in the vicinity of the cavity showing a substantially absence of silica between the grains of the first refractory oxide.

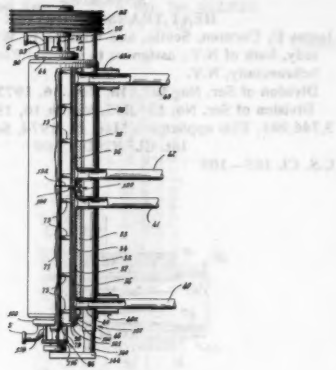
3,955,617

SWEPT SURFACE HEAT EXCHANGER WITH DUAL HEAT EXCHANGE MEDIA

John C. Walsh, Winchester, Mass., assignor to The De Laval Separator Company, Poughkeepsie, N.Y.

Filed Dec. 9, 1974, Ser. No. 531,060
Int. Cl.² F28F 5/00
U.S. Cl. 165—94 **6 Claims**

1. A swept surface heat exchanger comprising an inner heat exchange cylinder having a vertical axis, the cylinder also having a product inlet at one end and a product outlet at the other end, a rotor assembly mounted for rotation on the axis of said cylinder and including means for scraping the inner wall of the cylinder to free the same of product adhering thereto, upper and lower outer cylinders surrounding the upper and lower portions, respectively, of said inner cylinder and forming therewith upper and lower annular spaces, means sealing the opposite ends of each said annular space and including a double expansion joint located between said upper and lower outer cylinders for accommodating different rates of expansion and contraction of said inner and outer cylinders, and ducts for supplying different heat exchange media to said upper and lower spaces, respectively, said double expansion joint including two gaskets surrounding the inner cylinder and spaced vertically from each other, said gaskets engaging the inner surfaces of said outer cylinders, respectively, at their adjacent end portions, the adjacent ends of the outer cylinders being spaced vertically from each other, an abutment engaging each gasket and against which the gasket is adapted to be compressed to expand the gasket against the inner cylinder and the surrounding outer cylinder, and means for compressing the gaskets against said abutments and extending through the space between the adjacent ends of the outer cylinders.

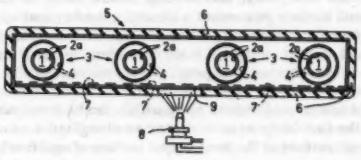


3,955,618

HEATING DEVICE

George Albert Apolonia Asselman, and Josef Wilhelmus Johannes Maria van der Leegte, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed July 11, 1973, Ser. No. 378,245
Claims priority, application Netherlands, July 19, 1972, 7209936
Int. Cl. F28d 15/00
U.S. Cl. 165—105 **5 Claims**



1. A heating device for use with a heat source, comprising a first heat pipe formed as a common heat reservoir, having walls, one of which is a bottom wall, with outside and inside surfaces, an outside surface of one wall being exposable to said heat source and the inside surfaces thereof defining a first heating space, first capillary material on the inside surface of at least said bottom wall, a plurality of separate heating chambers traversing said first heating space, each chamber being a heat pipe formed from an outer tube and an inner tube with a closed annular space defined by facing wall surfaces of said tubes and facing ends, and an oven space defined within the inner tube, second capillary material on said facing surfaces, and facing ends, vaporizable and condensable first and second heat transporting medium in said first heating space and in said annular spaces respectively, whereby, when heat is applied to said outside surface of the common reservoir wall, the first heat transporting medium in the first space is vaporized and flows to said heating chambers' outer tubes where it condenses on the outer surfaces of the outer tube walls, with heat transmitted through said outer tube walls to the second heat transporting medium within said annular spaces, which second medium vaporizes and flows to the inner tube wall

where it condenses and provides heat which is transmitted through said inner wall to said oven therein.

3,955,619

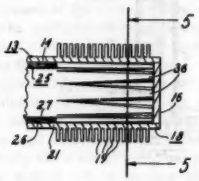
HEAT TRANSFER DEVICE

James C. Corman, Scotia, and Gunnar E. Walmet, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 307,118, Nov. 16, 1972, abandoned, Division of Ser. No. 124,805, March 16, 1971, Pat. No. 3,746,081. This application Mar. 11, 1974, Ser. No. 449,744

Int. Cl.² F28D 15/00

U.S. Cl. 165—105 3 Claims



1. In a heat pipe structure, the combination of a first elongated hollow body of relatively low thermal impedance, said first body being sealed at opposite ends thereof and having an inside wall surface and an outside wall surface, said first body with a heat input section including one end region thereof and with a heat output section including the other end region, said first body having an elongated chamber therewithin extending coaxially therewith from one sealed end thereof to an opposite sealed end thereof, said chamber being bounded by said inside wall surface of said first hollow body, a second elongated hollow body of wicking material situated in said chamber, said second body being open at opposite ends thereof, said wicking material having a thermal impedance which is greater than that of said first body, said second hollow body having an inside wall surface in contact with said chamber and an outside wall surface contacting the inside wall surface of said first body, said second elongated body of wicking material having at least one truncated elongated slot therein extending from one open end of said second body in a direction toward the opposite end of said second body within the heat output section of the first body so as to expose an elongated area of the inside wall surface of the heat output section of said first body, the elongated area so exposed extending from one sealed end of said first body in a direction toward the opposite end of said first body with the heat output section thereof, and a vaporizable liquid occupying at least said chamber of said first body.

3,955,620

HEAT EXCHANGER

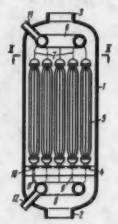
Lev Nikolaevich Artemov, ulitsa Pravdy, 24a; Anatoly Arkadievich Bilyavsky, ulitsa Entusiastov, 12, kv. 1; Stanislav Nikolaevich Vivsik, Bolnichny proezd, 3, kv. 56, all of Podolsk, Moskovskoi oblasti; Nikolai Vasilievich Zozulya, Reiterskaya ulitsa, 30, kv. 6, Kiev; Valery Ivanovich Manaenkov, ulitsa Mira, 8, kv. 10; Viktor Fedorovich Moskvichev, ulitsa Entusiastov, 10, kv. 9, both of Podolsk, Moskovskoi oblast, and Evgeny Alexeevich Fadeev, Sevanskaya ulitsa, 7, korpus 1, kv. 64, Moscow, all of U.S.S.R.

Filed Apr. 26, 1974, Ser. No. 464,653

Int. Cl.² F28F 9/00

U.S. Cl. 165—162 3 Claims

1. A heat exchanger comprising a casing; interchangeable heat-exchanging sections accommodated in said casing, and including main heat-exchanger means and auxiliary heat-exchanger means associated therewith; at least partly longitudinally finned tubes in said sections, having open ends and forming at least two bundles; said tubes having non-finned portions located at the same level for all tubes in each of said sections; tube plates for securing said open ends of the tubes with freedom of at least partial rotation; strips with alternating one-sided projections, each of the latter being shaped as half the perimeter of a rectilineal polygon, said strips serving as spacer elements for fixing said tubes at predetermined distances from one another, and arranged perpendicular to said bundles of the tubes; the widths of said strips being approximately equal to those of said non-finned portions of the tubes, formed by pairs of said strips and being fitted around said



non-finned portions; said main heat-exchanger means being uniformly distributed over the entire cross-section of the heat exchanger and being essentially constituted by said tubes in the at least two bundles, said tube plates and said strips; wherein said auxiliary heat-exchanger means includes bands embracing said bundles of the tubes and having projections on some of their external surfaces; and corrugated sheets along at least others of said external surfaces, for cooperation with said spacer elements; said main and said auxiliary heat-exchanger means providing for improved and uniform heat-exchange conditions throughout the entire cross-section of the heat exchanger.

3,955,621

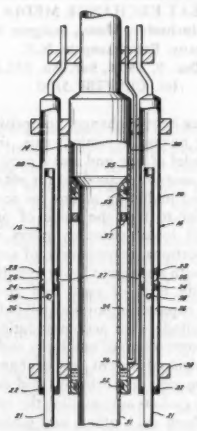
RISER ASSEMBLY

Derrel D. Webb, Houston, Tex., assignor to Houston Engineers, Inc., Houston, Tex.

Filed Feb. 14, 1975, Ser. No. 550,160

Int. Cl.² E21B 43/01

U.S. Cl. 166—.5 8 Claims



1. A riser assembly adapted to be suspended at its upper end from a drilling vessel and connected at its lower end to a blowout preventer stack of an underwater wellhead, said

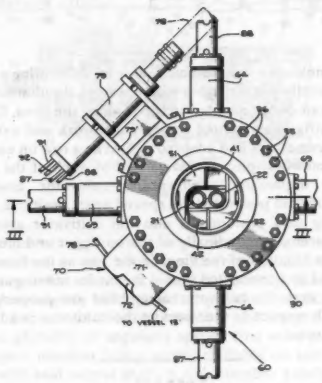
assembly comprising a riser pipe including telescopically arranged sections, means carried by the riser pipe for urging the sections thereof toward retracted position with a force which counteracts at least a portion of the force due to pressure fluid within the pipe urging said sections to extended positions, a choke line and a kill line carried by the riser pipe for extension longitudinally thereof, each line including telescopically arranged pipe sections, and means carried by each line for urging the sections thereof toward retracted position with a force which substantially balances that due to pressure fluid within the line urging said sections to extended position.

3,955,622

DUAL DRILL STRING ORIENTING APPARATUS AND METHOD

Howard W. Jones, Long Beach, Calif., assignor to Regan Offshore International, Inc., Torrance, Calif.

Filed June 9, 1975, Ser. No. 585,376
Int. Cl.² E21B *33/03*
U.S. Cl. 166—.5 **27 Claims**



1. Apparatus for orienting a pair of drill strings, which extend from a vessel floating on the surface of a body of water down into a subsea wellhead installation, in a predetermined manner in the center of a bore through a blowout preventer to facilitate closing off of the drill strings with respect to the wellhead at the blowout preventer, said apparatus comprising:

first drill string positioning means for positioning said drill strings into a predetermined central zone of the bore through the blowout preventer, said first positioning means including a pair of first opposed ram means operating under a predetermined maximum compressive force of said first ram means on said drill strings adapted to move from a first position out of engagement with said drill strings to a second position engaging said drill strings; and

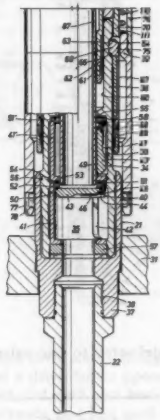
second drill string positioning means for moving said drill strings in said zone into a final centrally oriented position within the bore through the blowout preventer, said second drill string positioning means including a pair of second opposed ram means adapted to move from a first position out of engagement with said drill strings to a second position engaging said drill strings, said second ram means including orienting means for moving said drill strings to said final position whether said drill strings when positioned in said central zone are linearly aligned in a direction extending generally parallel to the direction of movement of said first ram means or linearly aligned in a direction extending generally normal to the direction of movement of said first ram means.

3,955,623

SUBSEA CONTROL VALVE APPARATUS

James T. Aumann, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Apr. 22, 1974, Ser. No. 462,824
Int. Cl.² E21B *33/00*
U.S. Cl. 166—.6 **17 Claims**



1. Apparatus adapted to be positioned within a subsea blowout preventer stack or the like for controlling the flow of fluid from an offshore well, comprising: a tubular valve body arranged to be coupled to a pipe string extending into a well bore and having a flow passage and valve means arranged for movement between positions opening and closing said flow passage; tubular housing means arranged to be coupled to a pipe string extending upwardly to the surface; valve actuator means within said housing means for moving said valve means from closed to open position; releasably locked connector means for connecting and disconnecting said housing means to and from said valve body; first remotely and selectively operable means for actuating said valve actuator means to cause movement of said valve means from closed to open position; and second remotely and selectively operable means for unlocking said connector means to enable connection of said housing means to, and release of said housing means from, said valve body.

3,955,624

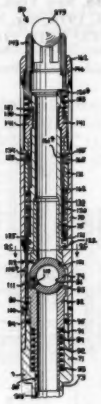
SAFETY VALVE FOR CONTROLLING FLOW IN A FLOW CONDUCTOR

John V. Fredd, Dallas, Tex.; William G. Hill, Lake Charles, La.; Benjamin E. Kearney, Dhahran, Saudi Arabia, and John W. Tynan, deceased, late of Houston, Tex. (by Dorothy H. Tynan, administratrix), assignors to Continental Oil Company, Ponca City, Okla.

Filed Oct. 21, 1974, Ser. No. 516,205
Int. Cl.² E21B *43/12*
U.S. Cl. 166—72 **25 Claims**

22. A safety valve for controlling flow in a flow conductor comprising: a valve body having a bore therethrough for fluid flow; a valve member secured in said bore of said body for controlling fluid flow in said bore; operator means connected with said valve member for moving said valve member between open and closed positions; means biasing said operator means to a valve-closed position; latch means coupled with said operator means for restraining said operator means at a position at which said valve member is open and for releasing said operator means to close said valve member; and means included in said latch means providing an impact responsive

surface at the discharge end of said valve for releasing said latch means to close said valve member responsive to contact



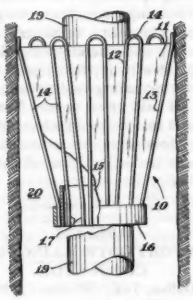
by an impact body delivered to said valve through said flow conductor.

3,955,625

CEMENTING BASKET

Earnest D. Hughes, and Peter W. Seitz, both of Wichita Falls, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 6, 1975, Ser. No. 556,056
Int. Cl.² E21B 33/134
U.S. Cl. 166—202 1 Claim



1. A basket apparatus for use in cementing a wellbore, which includes:

a series of petal members, an inner ring, and an outer ring which has a larger diameter than the inner ring and which fits over the inner ring;

each petal member comprising a flat section of a flexible elastomer material, which includes a leading edge, a trailing edge, and an elongate steel spring wire loop;

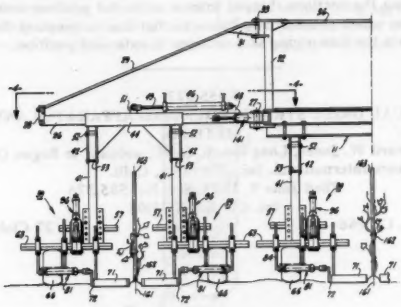
the wire loop being secured to the leading edge of each petal member, the wire loop including an open end which is fastened between the inner and outer rings, and the leading edge of each petal member being in overlapping contact with the trailing edge of an adjacent petal member, such that the arrangement of the petal members defines a generally circular pattern.

3,955,626

MULTI-ROW VINEYARD CULTIVATOR

Clyde L. Taylor, 1545 S. Chinowith Road, Visalia, Calif. 93277

Filed Nov. 29, 1974, Ser. No. 528,078
Int. Cl.² A01B 63/02, 39/16
U.S. Cl. 172—6 15 Claims



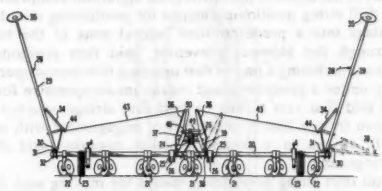
1. In a multi-row vineyard cultivator for cultivating a plurality of generally parallel rows of grapevines simultaneously, a wheeled framework adapted to travel along the rows, first and second outriggers mounted on the framework and extending from the framework and adapted to overlie a row on each side of the framework, post means carried by each of the outriggers and depending downwardly, cultivator assemblies mounted on said post means in spaced apart positions, means for moving said post means and the cultivator assemblies carried thereby longitudinally of the outrigger and means for sensing the location of the vines in the row as the framework is advanced and connected to said means for moving said post means so that the cultivator assemblies are properly positioned with respect to the vines as the cultivator is advanced down the rows.

3,955,627

ROW MARKER FOR AGRICULTURAL IMPLEMENT

Victor Elwyn Brown, Corpus Christi, Tex., assignor to E. L. Caldwell & Sons, Inc., Corpus Christi, Tex.

Filed May 13, 1975, Ser. No. 576,955
Int. Cl.² A01B 25/00, 49/04
U.S. Cl. 172—130 8 Claims



1. A row marker apparatus comprising a tool bar, a pair of independently operable row marker units on the tool bar near its opposite ends, a pair of independently operable marker control arms on the tool bar near its center, means interconnecting each control arm with one marker unit, a single extensible and retractable power device interconnecting said control arms, a stationary keeper element on the tool bar near said control arms, and a single gravity urged latch bar pivoted to each control arm and having a lower edge notch adapted to interlock with said stationary keeper element under the influence of gravity and having a leading end inclined face adapted to cammingly engage said keeper element to cause lifting of

the latch bar, and a side extension element secured to one of said latch bars adapted to engage cammingly said inclined face of the other latch bar for lifting the other latch bar, said side extension element also adapted to have said other latch bar pass beneath it and to be lifted thereby during engagement of said inclined face of the other latch bar with said keeper element, said latch bars disposed in side by side end to end overlapping engagement.

3,955,628

HAMMER DRILL

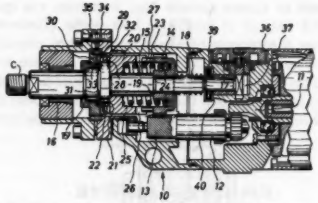
Dieter Grözinger, Echterdingen; Heribert Schramm, Stuttgart; Steffen Wünsch, Dettenhausen, and Erich Vogel, Bernhausen, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Apr. 18, 1974, Ser. No. 462,187

Claims priority, application Germany, May 9, 1973, 2323268

Int. Cl.² B25D *11/10*; E21C *1/02*

U.S. Cl. 173—13 **21 Claims**



1. A hammer drill comprising a housing; a driven output shaft mounted in said housing with freedom of limited axial displacement between a first and a second position; biasing means permanently biasing said output shaft to said first position; an impact member surrounding said output shaft and having a plurality of angularly spaced first axial projections, said impact member being axially shiftable on and rotatably driven with said output shaft; a disk member axially fixed on and freely turnably surrounding said output shaft and having plurality of spaced second axial projections adapted to interdigitate with said first axial projections; retaining means fixed in said housing and engageable with said disk member for preventing rotation of the same with said output shaft when an axial force is exerted upon said output shaft counter to said biasing means and axially displacing said output shaft to said second position thereof; and spring means acting on said impact member for causing the latter to impart hammer blows on said output shaft when said disk member is prevented from rotation with said output shaft while the latter continues to rotate.

3,955,629

MECHANICAL QUILL FEED UNIT

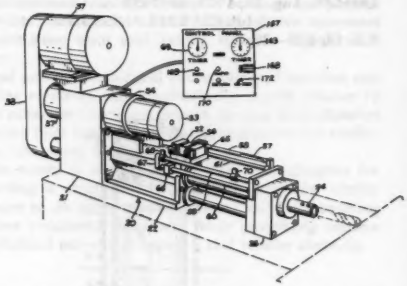
Frank W. Turner, 70 Sylvan, Pleasant Ridge, Mich. 48069

Filed Nov. 28, 1972, Ser. No. 309,957

Int. Cl.² B23B *47/20*

U.S. Cl. 173—19 **17 Claims**

1. In combination, at least one mechanical quill feed unit for advancing and rotating a tool along an axis comprising a frame member, a movable but non-rotatable tool quill having a tool rotating means mounted thereon and adapted for reciprocative movement with respect to said frame member along said axis, said tool quill being connected to said frame member by a reversible ball-screw assembly comprising a rotatable ball-screw and an inter-engaging sleeve means coaxial with said axis with the forward end of said sleeve means being connected to said tool quill and said ball-screw being rotatably connected to said frame member, a tool holder coaxial with said axis connected to the output of said tool rotating means, a tool rotating operating means connected to the input of said tool rotating means said tool rotating means including a pair of gears located in said tool quill, said gears lying in a plane perpendicular to said axis and being immediately adjacent said tool holder, with one of said gears being directly connected to said tool holder, with said tool rotating operating means including a hollow splined slipshaft, means drivingly connecting said other of said gears to said slipshaft, said slipshaft being



offset from said axis, a drive shaft drivingly connected to said hollow slipshaft and a drive motor operatively connected to said drive shaft, said tool quill also having tool quill control means to rapidly advance said tool quill toward a workpiece preparatory to performing a machining operation thereon, means to feed said tool quill at a controlled rate of speed while a machining operation is being performed, and to rapidly retract said tool quill to its original position when the machining operation is completed.

3,955,630

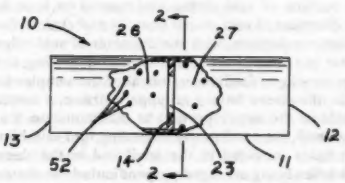
ELECTROSTATIC DEVICE AND GAME

John C. Thomas, 451 Queensboro Lane, Haddonfield, N.J. 08033

Filed Feb. 13, 1975, Ser. No. 549,713

Int. Cl.² A63F *7/04*

U.S. Cl. 273—153 R **2 Claims**



1. An amusement device for challenging one's ability to position objects within a given area therein because of a static charge, comprising; a transparent elongated and enclosed container made from an electrically insulating material, having a plurality of small movable objects also made from an electrically insulating material encased within said container, said container further having at least one barrier transversely disposed therein thereby dividing the container into a plurality of intercommunicating chambers including two outermost chambers, said outermost chambers being symmetrical with respect to the barrier, the said at least one barrier having a passageway to enable movement of the movable objects from one chamber to another, and the movable objects being of such size and weight to enable them to adhere to the side walls of the container in its charged condition.

3,955,631

SOIL SAMPLER

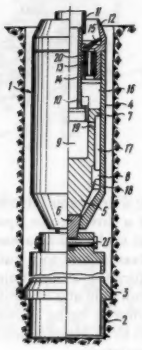
Alexandr Dmitrievich Kostylev, ulitsa Derzhavina, 19, kv. 44; Konstantin Stepanovich Gurkov, ulitsa Derzhavina, 19, kv. 13; Leonid Georgievich Rozhkov, ulitsa Krylova, 41, kv. 40; Khaim Berkovich Tkach, ulitsa Gogolya, 17, kv. 49, all of Novosibirsk; Evgeny Ivanovich Tanov, ulitsa Dzerzhinskogo, 34, and Viktor Yakovlevich Ploschadny, prospekt Svobody, 5, kv. 11, both of Ashkhabad, all of U.S.S.R.

Filed Aug. 1, 1974, Ser. No. 493,857

Claims priority, application U.S.S.R., Aug. 29, 1973, 1956659; Aug. 29, 1973, 1957455

Int. Cl.² E21B *11/02*, *9/16*

U.S. Cl. 175—20 2 Claims



1. A soil sampler comprising: a self-propelled air-operated percussion mechanism; a housing for said air-operated percussion mechanism and an anvil; a soil sample receiving sleeve rigidly connected with said housing of the air-operated percussion mechanism; said sleeve and said percussion mechanism being arranged coaxially one above the other; said sleeve having an outside lateral surface; an annular ridge on the outside surface of said sleeve and spaced at least half the outside diameter of said sleeve from its end remote from said percussion mechanism, with the diameter of said ridge being somewhat in excess of the diameter of said housing, the annular ridge serving to facilitate removal of the samples from the borehole, the sleeve having an upper portion, a central axial blind hole in the upper portion to communicate the sleeve with the anvil, the anvil partly extending into said blind hole, through holes provided in the anvil and in the sleeve, said through holes being arranged perpendicularly to the common axis thereof and a pin accommodated in the through holes, with the pin retaining the sleeve during sampler extraction from the soil.

3,955,632

PIPE LAYING APPARATUS

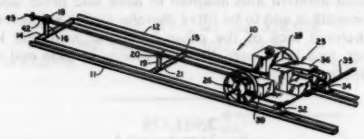
Harce McGhee, Box 101, Brookfield, Ga. 31727, and Richard S. Sapp, Rte. 1, Enigma, Ga. 31749

Filed Dec. 2, 1974, Ser. No. 528,638

Int. Cl.² E21B *11/02*

U.S. Cl. 175—22 9 Claims

1. Pipe laying apparatus, for inserting a pipe through the ground along a straight line, comprising a track disposed parallel to said straight line outside said ground, pipe guide means carried by said track for supporting said pipe parallel to said track and along said straight line, pipe drawing means fixed to one end of said pipe for pulling said pipe through the ground during rotation of said pipe drawing means, and means for rotating said pipe, said pipe drawing means including a



gimlet axially aligned with said pipe, and at least one propellor extending outwardly perpendicular to the axis of said gimlet.

3,955,633

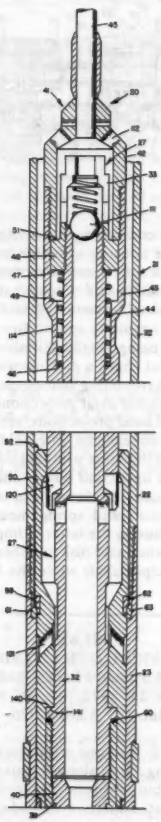
DRILL

Raymond Ernest Bowles, West Preston, Australia, assignor to Mindrill Limited, Preston, Australia

Filed Apr. 26, 1974, Ser. No. 464,315

Int. Cl.² E21B *9/26*

U.S. Cl. 175—258 5 Claims



1. A drill comprising:

a tubular drill string having a series of circumferentially spaced slots adjacent its lower end; and

an apparatus releasably mountable on the bottom of said drill string, said apparatus having a body rotatable with said drill string, a cutting bit at the lower end of said body,

a plurality of cutters arranged about the drill axis above said bit and movable between inner and outer positions, said cutters serving, when in their outer positions during drilling, to ream the hole cut by said bit to a size which permits said drill string to pass along the reamed hole, a structure movable vertically with respect to said body between a first position and a second position, said structure chocking said cutter elements in said outer positions when said structure is in said first position but permitting retraction of said cutter elements to their inner positions when it is moved to said second position, a plurality of rotary drive dogs each movable between an outer position in which to engage said drill string and said body so as to provide a torque coupling between said drill string and said body and a retracted position in which said dogs are disengaged from said drill string, each of said rotary drive dogs being provided with a slidable cam means engagable with a complementary cam means on said structure to cause the retraction of said dogs on movement of said structure from said first position to said second position so that said apparatus is withdrawable through said drill string on release from the bottom end thereof when said cutters are in said inner positions and said rotary drive dogs are retracted, and biasing means to bias each dog outwardly when said structure is in said first position, whereby in the event that said structure is moved to said first position when said drive dogs are circumferentially displaced from alignment with said slots, said drive dogs are forced outwardly by said biasing means into engagement with said slots on rotation of said drill string.

3,955,634

HYDRAULIC WELL JAR

Damon T. Slator; Archie W. Peil, and Thomas R. Bishop, all of Houston, Tex., assignors to Bowen Tools, Inc., Houston, Tex.

Filed June 23, 1975, Ser. No. 589,416
Int. Cl.² E21B *1/10*
U.S. Cl. 175—297 **15 Claims**

1. A hydraulic jar tool comprising:

inner and outer telescopically related tubular elements movable longitudinally relative to each other;

means for connecting one of said elements to a drill pipe string;

means for connecting the other element to an object to be jarred in a well;

jarring surfaces on said tubular elements for jarring contact with each other;

said inner and outer tubular elements having telescopically overlapping portions providing an annular space therebetween;

a first pair of annular seal means disposed between said tubular elements and longitudinally spaced relative to each other for forming a first annular fluid chamber for confining a hydraulic operating fluid;

fluid restriction means in said first annular fluid chamber for resisting relative longitudinal movement of said tubular elements to an extended position;

means for releasing said fluid restriction means after a predetermined relative movement between said tubular elements for subsequent unrestrained relative movement therebetween until said jarring surfaces engage each other;

a second pair of annular seal means disposed between said tubular elements and longitudinally spaced relative to each other for forming a second annular fluid chamber separate from said first annular fluid chamber for confining a lubricating fluid; and

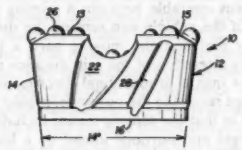
rotation means in said second annular fluid chamber for imparting a rotational driving force from the tubular element to the other tubular element and for preventing relative rotational movement while permitting relative longitudinal movement between said tubular elements.

3,955,635

PERCUSSION DRILL BIT

Sam C. Skidmore, 1513 Azteca Drive, Fort Worth, Tex. 76112

Filed Feb. 3, 1975, Ser. No. 546,508
Int. Cl.² E21C *13/01*
U.S. Cl. 175—400 **8 Claims**



1. A percussion drill bit adapted for drilling particularly hard matter such as rock, comprising:

a. a substantially solid body having a relatively flat face at its forward end, and the face including a plurality of plateaus separated by radial relief channels, with the outer ends of said relief channels intersecting major spiral grooves extending along the sides of the bit, and the cross-sectional areas of said relief channels and the major grooves being approximately the same at their point of intersection, and the sides of said body constituting a frustrum of a cone having an included angle of about 14°, with the narrow portion of the cone being at the base of the body, and the face of said body further having a center portion which is recessed with respect to the plateau portions, and the major spiral grooves extending from the face to near the base and having a negative relief of about 15° from the base toward the face, whereby the movement of relatively large cuttings away from the face of the bit and along the major spiral grooves to the base thereof is fostered;

b. a plurality of flow passages extending through the body of the drill bit for the delivery of drilling fluid to the face of the bit, and said passages terminating on the face near either the relief channels or the recessed center; and

c. a plurality of hardened inserts widely distributed across the face and protruding therefrom, and there being at least some hardened inserts distributed around the periphery of the face in such a way that they protrude slightly beyond the maximum diameter of the bit body.

3,955,636

WEIGHING APPARATUS FOR TRUCK AND VEHICLE LOADS

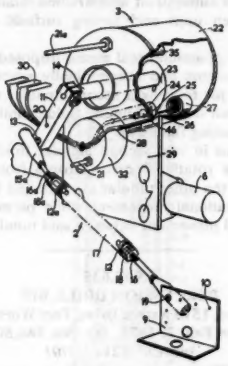
Malcolm Anthony Askew, 64 Moonshine Road, Upper Hutt, Wellington, New Zealand

Continuation-in-part of Ser. No. 472,769, May 23, 1974. This application Feb. 7, 1975, Ser. No. 547,831

Claims priority, application New Zealand, June 1, 1973, 170913

Int. Cl.² G01G *19/08*

U.S. Cl. 177—137 9 Claims



1. An apparatus for providing an indication of the weight of a load on a vehicle or on any part of the vehicle comprising a sensing means operable between a moving part and a stationary part of the vehicle and sensing the distance between the stationary part and the moving part, a transducer unit converting any alteration of the said distance detected by the sensing means into a proportional electric property and an electrical gauge receiving the output from said transducer unit characterised in that the sensing means includes a sensor arm having two rigid end portions joined by a longitudinally incompressible and laterally flexible expansion spring in a turnbuckle effect, with the rigid end portions being adapted to be connected between the moving part and the stationary part of the vehicle in such a manner as to detect any alteration of the aforesaid distance.

3,955,637

WEIGHING APPARATUS

Victor Del Rosso, Ithaca, N.Y., assignor to Hi-Speed Checkweigher Co., Inc., Ithaca, N.Y.

Filed June 10, 1975, Ser. No. 585,476

Int. Cl.² G01G *19/14*

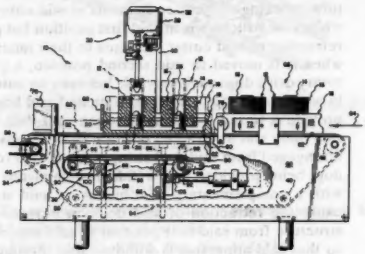
U.S. Cl. 177—145 15 Claims

1. An article weighing apparatus comprising in combination:

a weighing station having at least one article weighing unit, said unit including a stationary scale device having a vertically displaceable operating member, clamping means for releasably clamping said article, and means for operably interconnecting said clamping means with said operating member when an article to be weighed is clamped thereby, while normally supporting said clamping means free of operable connection with said operating member;

conveyor means for transporting articles through said weighing station and for positioning a transported article in essential vertical alignment with said clamping means; and

elevating means operable for lifting said transported article when disposed in essential vertical alignment with said clamping means from said conveyor and into weighing association with said clamping means to permit the lifted article to be clamped by said clamping means and



weighed by said scale device and for lowering a weighed article onto said conveyor means for subsequent discharge from said weighing station.

3,955,638

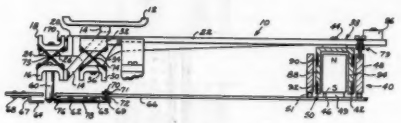
PRECISION BALANCE

Bernard Wasko, Bronxville, N.Y., assignor to Voland Corporation, New Rochelle, N.Y.

Filed Mar. 5, 1975, Ser. No. 555,578

Int. Cl.² G01G *1/38*

U.S. Cl. 177—212 19 Claims



1. A load compensated weighing device comprising

load support means for supporting a load to be weighed;

means for unbalancing the load support means at a no-load condition to create an initial unbalance so that a restoring force is required at the no-load condition to restore the support to a null condition;

electro-magnetic restoring means for restoring the load support means to its null condition;

means responsive to unbalance of the support means for sensing the unbalance;

means responsive to the initial unbalance of the support means for energizing the restoring electro-magnetic means with current of a first polarity, to null the initial unbalance; and

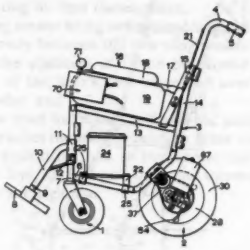
means responsive to an unbalance opposing the initial unbalance and greater than the extent of the initial unbalance for energizing said electro-magnetic means with a current of a polarity different from said first polarity, so that the extent of heating resulting from energizing said electro-magnetic means is smaller by a factor substantially greater than one than the heating where the polarity of the current is always the same and there is no initial unbalance.

3,955,639

WHEEL CHAIRS

Harold Cragg, Birmingham, England, assignor to The Spastics Society, London, England

Division of Ser. No. 308,790, Nov. 22, 1972, Pat. No. 3,901,337. This application Dec. 4, 1974, Ser. No. 529,561
Claims priority, application United Kingdom, Nov. 24, 1971, 54518/71
Int. Cl.² B62D 11/04
U.S. Cl. 180—6.5 5 Claims



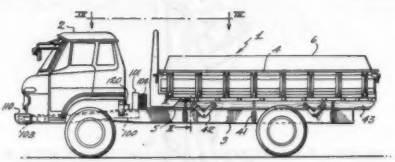
1. An electrically driven wheel chair comprising a foldable frame supported on two pairs of wheels, the rear pair of said wheels being independently driven by electric driving means comprising an electric motor for each wheel of said rear pair; and battery power means connected to said electric motor through operable control means, a pair of wheel plates each supporting one of said rear wheels and said electric motor associated therewith, mounting means connected to said frame and mounting independently each one of said wheel plates for pivotal resilient movement of each of said wheel plates together with said rear wheel supported thereon about a horizontal axis inependent of said frame.

3,955,640

ABSORBING SAFETY ARRANGEMENT FOR A TRUCK

Akira Yamanaka, Yokohama, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 23, 1974, Ser. No. 500,014
Int. Cl.² B60R 21/02
U.S. Cl. 180—91 3 Claims



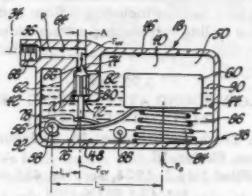
1. A truck comprising:
a body frame;
a cab fixed to said frame;
a loading table positioned on the frame rearwardly of the cab;
energy absorber means operatively related to said frame and the table, said energy absorber means including means for joining said table to the frame, said joining means being responsive to a force on said table in excess of a predetermined value for permitting movement of the table with respect to the frame forwardly towards said cab whereby during said movement kinetic energy of said moving table is absorbed by the energy absorber means; and
energy transmission means joined by connecting means to said frame forwardly of the table, said energy transmission means including a front portion extending forwardly of the cab and a rear portion interposed between said cab and the table, said connecting means being responsive to impact on either of said front and rear portions in excess of a predetermined magnitude for permitting rearward and forward movement, respectively, of the energy transmission means with respect to the frame whereby kinetic energy developed by said impact is absorbed by the energy transmission means.

3,955,641

SAFETY SHUT-OFF FUEL SYSTEM

Marion L. Smitley, Birmingham, Mich., assignor to Colt Industries Operating Corporation, New York, N.Y.

Filed June 6, 1975, Ser. No. 584,650
Int. Cl.² B60K 28/00
U.S. Cl. 180—104 6 Claims



1. In a regulated liquid reservoir, the combination of a float regulated liquid inlet and safety shut off valve means, comprising housing means defining chamber means, passage means carried by said housing means and effective for conveying said liquid from a remotely situated source of said liquid to said chamber means, float means pivotally retained within said chamber means, said float means being positioned as to be acted upon by the attendant buoyant force of said liquid within said chamber means, valving means situated in cooperative relationship to said passage means and effective to regulate the rate of flow of said liquid from said passage means into said chamber means, said valving means being operatively connected to said float means as to thereby be openable and closeable in accordance with associated movement of said float means, and resilient means operatively connected to said float means, said resilient means exhibiting a preload force of a magnitude sufficient to cause and maintain closure of said valving whenever said liquid reservoir and said source are positioned in an attitude considered abnormal to the accepted mode of operation of said reservoir, said preload force being of a magnitude at least equal to a counter-force developed against said valving means by the pressure head of said liquid within said source during the said abnormal attitude thereof.

3,955,642

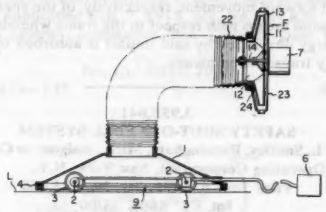
VEHICLE

Makoto Shino, 4-8-53, Hizaore, Asaka, Saitama, and Mitsuo Saito, 5-5-14, Narimasu, Itabashi, Tokyo, both of Japan

Division of Ser. No. 463,377, April 23, 1974, Pat. No. 3,926,277. This application Dec. 31, 1974, Ser. No. 537,860
Claims priority, application Japan, Apr. 25, 1973, 48-46073
Int. Cl.² B60B 39/00
U.S. Cl. 180—115 1 Claim

1. A vehicle comprising a hollow body formed to define an interior space with an opening at the bottom; a plurality of travelling wheels suspended on said body; a depending member suspended from the bottom peripheral edge of said body to serve the packing function in cooperation with the surface over which the vehicle travels; while drive means for driving at least one of said traveling wheels; a fan unit having a fan and fan drive means and arranged separate from said body, said fan having a suction port and a delivery port opening to the

atmosphere, and a flexible, extensible air duct connecting the suction port of said fan with the interior of said body for fluid communication therewith, said air duct having a length sufficient to permit free movement of the vehicle independently of said fan unit on a surface including a floor surface, a vertical wall surface, a ceiling surface and a steep slope surface.



3,955,643

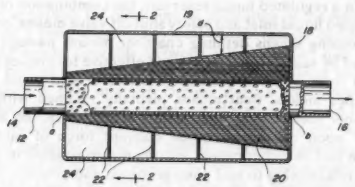
FREE FLOW SOUND ATTENUATING DEVICE AND METHOD OF MAKING

Raymond C. Clark, Lake Forest, Ill., assignor to Brunswick Corporation, Skokie, Ill.

Filed July 3, 1974, Ser. No. 485,602

Int. Cl.² F01N *1/04*

U.S. Cl. 181—42 **44 Claims**



1. A device for attenuating the sound level in a fluid flowing therethrough, comprising:

a conduit with one end an inlet and the other end the outlet and having a central foraminous portion;

a layer of sound absorbing material surrounding the foraminous portion of the conduit to define a covered conduit; the sound absorbing material having a static flow resistance continuously increasing from the inlet to the outlet of the covered conduit; and

a housing surrounding the covered conduit and secured to the inlet and outlet to define a plurality of quarter-wave standing wave cavities in series after the inlet in operative association with the covered conduit.

3,955,644

SCAFFOLDING CONSTRUCTIONS

Raymond Ernest Steele, Kenilworth, England, assignor to Kwikform Limited, Birmingham, England

Filed July 14, 1975, Ser. No. 595,540

Claims priority, application United Kingdom, July 19, 1974, 32014/74

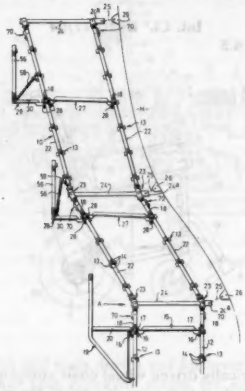
Int. Cl.² E04G *1/06*

U.S. Cl. 182—82 **14 Claims**

1. In a scaffolding structure comprising:-

a. a plurality of generally vertically superposed uprights arranged in horizontally spaced parallel pairs and each provided at spaced intervals along their lengths with groups of sockets, and

b. cross members each including at opposed ends thereof connecting means firmly engaging selected ones of said sockets, the cross members comprising firstly transom elements extending between the uprights of each pair and secondly ledger elements extending between the uprights of adjacent pairs, whereby staging can be supported between adjacent pairs of said uprights, the improvement comprising



c. joint means for connecting said uprights together in superposed relation in a vertical plane with said superposed uprights in inclined relation to one another in said plane, and

d. means for tying the structure into an adjacent wall or other structure at least where the uprights are arranged out of the vertical.

3,955,645

TREE CLIMBING STAND AND LOOP

James E. Dye, P.O. Box 1664, Athens, Ga. 30601

Filed Dec. 4, 1974, Ser. No. 529,592

Int. Cl.² A63B *27/02*; A47C *9/10*

U.S. Cl. 182—135 **7 Claims**

1. Tree climbing equipment, comprising:

a stand, including a generally rectangular platform having upstanding wing means at the sides thereof and a generally concavely V-shaped front edge for confronting a tree trunk;

a flexible strap having a plurality of prongs projecting from one face thereof midway along the length thereof for biting into a tree trunk;

means defining fasteners associated with the wing means and with the flexible strap, near the opposite ends of the strap for securing the strap, near the opposite ends thereof, to the wing means so that the strap loops from one wing means forwardly and upwardly to the vicinity of the prongs, then downwardly and rearwardly to the other

wings means, the fasteners being adjustable to vary the girth of the loop defined by the strap and by the front edge of the platform, so that the girth may be adjusted to permit the stand to be slipped upwards or downwards on a tree trunk encircled by the loop while the loop is generally horizontal and the platform rear is tipped up, but will hug the tree trunk and have the prongs bite thereinto when the platform is leveled and the loop is consequently tipped;

binding means for securing a user's feet to the stand, whereby the user may raise, lower, tilt and level the stand by reacting his feet thereagainst;

the binding means being constituted by a rigid bar extending transversely between the two wing means at such spacing above the platform as to be positioned to engage the insteps of the user's feet when the user's toes are slid thereunder; and

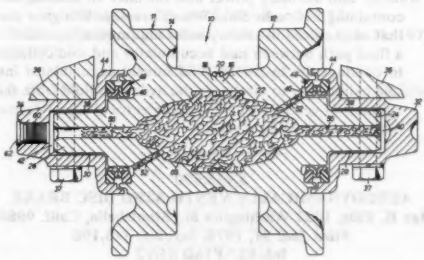
two elastic cord loops on the platform, positioned to resiliently bracket the user's heels in a sense to hold the user's insteps against the bar, so that as the user lifts upwardly with his feet, his feet pull the stand upwardly by applying force to the rigid bar.

3,955,646

TRACK ROLLER WITH OPEN CELL PLASTIC FOAM IN LUBRICATION CAVITY

Leroy Luebkemann, Springfield, Ill., assignor to Fiat-Allis Construction Machinery, Inc., Deerfield, Ill.

Filed Aug. 6, 1974, Ser. No. 491,768
Int. Cl.² F16N 9/00
U.S. Cl. 184—12 **10 Claims**



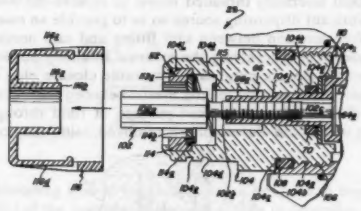
8. In a track roller assembly: a rotatable track roller having a lubrication cavity therein and said track roller having a pair of axially aligned axles on opposite ends of the track roller; said roller being composed of two sections joined together; a frame supporting said track roller; a pair of end caps positioned, respectively, about the end portions of each of said axles, said caps being non-rotatable and fixedly connected to the frame, each end cap having a recess receiving an end portion of each axle of said roller; bearing means supported in said recess of each of said end caps and in which an associated axle is journalled to enable rotation of said track roller with respect to said non-rotatable end caps; first passage means extending through said axles and communicating with said lubrication cavity and the recess in each of said end caps; and means disposed in said cavity for storing lubricant for to said bearing means; said first passage means connecting the cavity and the bearing meuns to permit passage of a lubricant to the bearing means; said means disposed in said cavity comprising a solidified mass of open cell foamed material.

3,955,647

ADJUSTABLE CONTROL AND LOCK MEANS THEREFOR, SUCH AS FOR USE WITH AN AIR-OPERATED LUBRICATOR

Sebastian David Tine, Lawrence; Albert W. Dewberry, Boxford, and Alfred S. Schommer, Lowell, all of Mass., assignors to Watts Regulator Company, Lawrence, Mass.

Division of Ser. No. 315,496, Dec. 15, 1972, Pat. No. 3,841,438. This application Sept. 16, 1974, Ser. No. 506,296
Int. Cl.² F01M 1/16; F16N 7/34
U.S. Cl. 184—56 R **12 Claims**



1. In a selectively adjustable control and lock means therefor that includes body means with a screw-threaded portion, an elongated controller whose position relative to said body means is selectively adjustable longitudinally in opposite directions by said controller having a portion thereof screw-threaded to said screw-threaded portion of said body means, and movable lock means operatively associated with the controller to selectively permit or prevent further screw movement of the controller, the improvement comprising, in combination:

the controller having an elongated portion that is longitudinally splined;

ring means provided on thhe body means positioned concentrically of the longitudinally splined portion of the controller and spaced therefrom, second spline means on said ring means;

a lock collar splined to said longitudinally splined portion of the controller and axially movable longitudinally thereof, said lock collar bridging the space between the controller and the concentric ring means, second spline means on the lock collar arranged for engagement with said second spline means on the ring means when the lock collar is in axial position adjacent the ring means but being free of the second spline means on the ring means when the lock collar has been moved axially away from said ring means;

spring means normally biasing the lock collar toward said ring means;

and an adjuster for selectively rotating the controller, said adjuster including means for selectively axially displacing the lock collar away from the ring means against the bias of the spring means.

3,955,648

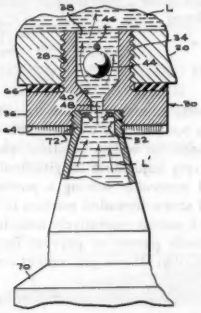
REMOVABLE TYPE LUBRICATING FITTING

Frank J. Walker, Jr., P.O. Box 1178, and Frank J. Walker, Sr., 9800 NE. 5th Ave. Road, both of Miami, Fla. 33138

Continuation-in-part of Ser. No. 367,186, June 5, 1973, abandoned. This application Oct. 15, 1974, Ser. No. 515,095
Int. Cl.² F01M 1/04
U.S. Cl. 184—105 B **7 Claims**

1. A lubrication fitting for a marine power-transmission housing, said fitting being a fluid control device that prevents flow of fluid therethrough at all times except when specifically actuated for the purpose of passing fluid therethrough; upon such actuation, said fitting including flow control means for automatically permitting flow therethrough of lubricant from an outside source and for automatically preventing flow of fluid therethrough in the reverse direction unless additionally

actuated specifically for the purpose of allowing such flow; and said fitting including junction means for providing an essentially leakfree junction with an outside dispensing source of lubricant, said fitting receiving lubricant at said junction for passage therethrough, said junction being located at the exterior termination of said fitting wherein said fitting consists of an externally threaded cylindrical member having an integral coaxial flange member of larger diameter than said threaded cylindrical member, said flange member beginning at the external termination of said fitting, said threaded member beginning at the internal termination of said fitting, said flange member having a smooth coaxial recess therein converging to a coaxial internally threaded recess to receive the nozzle of the lubricant dispensing source so as to provide an essentially leak-free junction between said fitting and said nozzle, said threaded recess receiving the external threaded portion of a removable closure plug, said removable closure plug sealing said smooth recess by sealing means between said recess and said closure plug to prevent passage of fluid through said fitting unless said closure plug is removed, said fitting containing a coaxial aperture connecting the interior termination of said fitting with said threaded recess, said aperture diverging to a larger cross-sectional area a short distance in from the interior termination of said fitting to form a cylindrical chamber within the apertured member, said chamber converging to a smaller cross-sectional area than said chamber prior to the junction of said aperture with said threaded recess; said chamber containing said sealing element, said sealing element being free to move within said chamber with sufficient clearance to readily permit the passage of fluid between said sealing element and the walls of said chamber, said sealing element sealing said aperture against flow of fluid outward therethrough when held against the converging portion of said aperture; said sealing element being retained within said chamber by the diverging portion of said aperture located near the interior termination of said device so as to allow said sealing element to move away from said converging portion of said aperture when fluid flows inward through said aperture, and torque being applied to said fitting for the purpose of installing said fitting into a threaded hole.



3,955,649

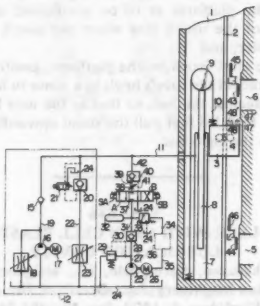
DEVICE FOR CORRECTING FLOOR LEVEL OF HYDRAULIC ELEVATOR

Mitsuaki Takenoshita, Katsuta; Ken Ichiryu, Mito; Ichiro Nakamura, Katsuta; Yukio Murakami, Katsuta, and Hiroshi Yumino, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 12, 1974, Ser. No. 441,899
Claims priority, application Japan, Feb. 16, 1973, 48-18261
Int. Cl.² B66B *1/04*
U.S. Cl. 187—29 A **12 Claims**

1. A device for correcting the level of an elevator cage in a hydraulic elevator system provided with a cylinder set including a plunger and a cylinder, said cage being driven in the shaft corresponding to the motion of said cylinder set by controlling the hydraulic fluid oil in said cylinder through a main power unit, wherein said device comprises detecting means to electrically detect the relative position of said cage to a landing floor, said detecting means including first means provided on said cage and second means provided in said shaft, said first and second means being associated with each other to detect said relative position and being so arranged that said first and second means are spaced from one another in a direction transverse to the running direction of said cage whenever said cage is being driven by said main power unit, said first and second means functioning as means for detecting positional deviations of the cage from respective predetermined stop positions in response to an external cage-stop indicating signal; and an auxiliary power unit to control, in accordance with an electrical signal derived from said detecting means, said hydraulic fluid in said cylinder so that said cage is stopped at respective predetermined stop positions,

wherein said auxiliary power unit includes an accumulator containing hydraulic fluid whose pressure is higher than that of the fluid in said cylinder and means, provided in a fluid path between said accumulator and said cylinder, to conduct the hydraulic fluid in said accumulator into said cylinder or to discharge the hydraulic fluid from said cylinder in accordance with said electrical signal derived from said detecting means.

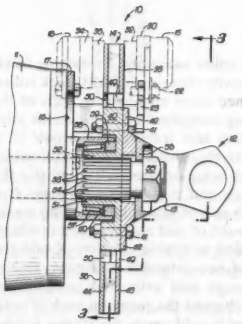


3,955,650

AERODYNAMICALLY VENTILATED DISC BRAKE

Max H. Ellis, 1422 Washington St., Montebello, Calif. 90640

Filed Jan. 31, 1975, Ser. No. 546,190
Int. Cl.² F16D *65/12*
U.S. Cl. 188—71.1 **11 Claims**



1. In a motor vehicle for travel in a selected direction equipped with a drive shaft assembly located parallel to the

direction of travel and differential housing accommodating a pinion shaft of said drive shaft assembly,

the combination of an aerodynamically and thermovolumetrically cooled central disc brake unit comprising a disc assembly having a non-rotatable attachment to the pinion shaft assembly and

a braking member having a fixed attachment to the differential housing,

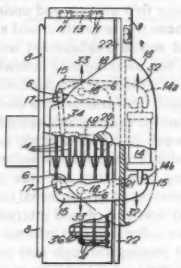
said disc assembly comprising a pair of forward and aft spaced balanced parallel discs in a plane perpendicular to said direction of travel,

each disc comprising a plurality of paired airfoil shaped vanes and spacers at uniformly circumferentially spaced locations, each paired vane and spacer on one disc being at locations alternating with each paired vane and spacer on the other disc, said airfoil shaped vanes and spacers being arcuate and extending from an inside end to an outside end obliquely rearwardly relative to a clockwise rotation of said drive shaft, said air foil shaped vane and spacers each being thicker at the inside end than at the outside end, the space between adjacent inside ends of said air foil shaped vanes being less than the space between adjacent outside ends of the same vanes whereby there are passageways in between adjacent vanes expanding progressively outwardly from an inside end to an outside end, the outside ends of said passageways being in unobstructed communication with the surrounding atmosphere, said spacers being located in said passageways, and a forward facing port on the forward disc in communication with the inside end of each said passageway.

3,955,651
BAND BRAKES

Mitja Victor Hinderks, 15A Adamson Road, London N.W. 3, England

Filed Apr. 23, 1973, Ser. No. 353,735
Claims priority, application United Kingdom, Apr. 21, 1972, 18531/72
Int. Cl.² F16D 49/12
U.S. Cl. 188—77 R **13 Claims**

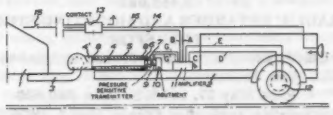


1. A band brake system comprising a brake drum having an annular flange, a flexible band arranged about the annular flange of said drum, said flexible band having overlapping ends and including a friction element for engaging said annular flange, each overlapping end of said flexible band having a plurality of band elements extending therefrom, the band elements of one overlapping end intermeshing with the band elements of the other overlapping end of said flexible band, fluid actuator means operatively connected to each overlapping end of said flexible band for substantially simultaneously moving said overlapping ends in opposite directions whereby, upon actuation of said actuator means, said friction element is radially contracted to engage said annular flange.

3,955,652
OPERATING SYSTEMS FOR TRAILER BRAKES

Sture Nils Nilsson, Jakobsberg; Rune Sven Nilsson, and Ingmar Karl Linus Andren, both of Lindesberg, all of Sweden, assignors to AB Linde International, Lindesberg, Sweden

Continuation of Ser. No. 451,699, March 15, 1974, abandoned, which is a continuation of Ser. No. 252,867, May 12, 1972, abandoned, which is a continuation of Ser. No. 38,241, May 18, 1970, abandoned. This application Dec. 30, 1974, Ser. No. 537,427
Claims priority, application Sweden, May 23, 1969, 7322/69
Int. Cl.² B60T 7/20
U.S. Cl. 188—112 **7 Claims**



1. Operating system for trailer brakes adapted to regulate the effect of the brakes of the trailer vehicle in dependence on changes in load occurring on the coupling unit between tractor and trailor vehicles as a result of differences in relative speed between said vehicles comprising:

tractor and trailer coupling means connected to each other forming a substantially rigid coupling unit,

transmitter means sensing pressure and pull connected in said coupling unit activated by even small changes in relative positions of said coupling means,

amplifier means responsive to pressure and pull on said transmitter means including

a pair of input differentially connected transistors,

a pair of complementarily connected transistors connected to said first-mentioned pair of transistors,

diode bridge networks connected preceding the input of said first-mentioned transistors and following the output of said second-mentioned transistors,

and damper means to prevent oscillations in the tractor-trailer unit;

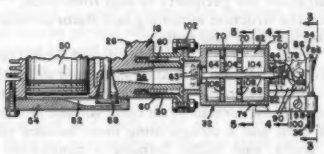
power source to the brakes connected to and controller by said amplifier means,

and brake light circuit means connected in such system of above-mentioned means to operate said system when said circuit means is closed.

3,955,653
ROTARY MOWER BLADE ARRESTER APPARATUS

Robert C. Comer, Hopkins, Minn., assignor to The Toro Company, Minneapolis, Minn.

Filed Apr. 25, 1974, Ser. No. 463,960
Int. Cl.² A01D 75/20; F02D 9/06, 9/02
U.S. Cl. 188—273 **5 Claims**



1. Apparatus for braking an implement powered by an internal combustion engine including a piston mounted for reciprocating movement in a cylinder and a valved exhaust passage communicating therewith, a valve therein opening and closing in synchronization with piston movement to allow flow of fluids through said exhaust passage to accomplish said exhaust function, comprising:

a. a muffler unit connected to said exhaust passage and having a housing carrying a plurality of perforated baffle plates with axially aligned guide holes therein;

b. a poppet valve having a valve head carried by an actuator stem extending through said guide holes, said poppet valve being operable in a first, open position to allow control of fluid movement through said exhaust passage by the synchronized valve associated with said exhaust passage, and operable in a second closed position to substantially reduce flow therethrough; and

c. control means for causing said poppet valve to assume said second position when implement braking is desired.

3,955,654

HYDRAULIC RETARDER AND MOUNTING STRUCTURE THEREFOR

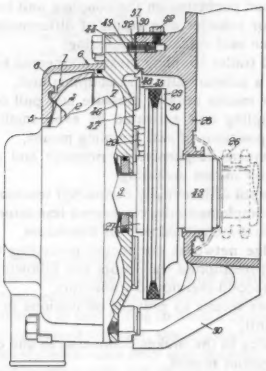
Daniel Claude Lemonnier, Paris, France, assignor to Labavia-S.G.E., Paris, France

Filed May 27, 1975, Ser. No. 580,620

Claims priority, application France, June 4, 1974, 74.19247

Int. Cl.² F16D 57/04, 65/02

U.S. Cl. 188—296 **11 Claims**



1. A hydraulic retarder for braking a shaft end projecting from a housing and carrying a driving pulley, said retarder comprising:

a stub which is connected to said shaft end for rotation therewith;

a rotor comprising a rotor shell mounted on said stub;

a stator enclosing said rotor and comprising a stator shell relative to which said rotor shell is rotatively movable, said stator providing a central liquid intake chamber situated near the axis of said rotor and a discharge chamber adjacent the periphery of said rotor shell;

an apertured structure mounting said stator on said housing and surrounding said pulley;

means for introducing a working liquid from the central intake chamber into said rotor shell from which the liquid is discharged into the peripheral discharge chamber;

an annular baffle formed by an outer surface portion of said rotor shell and a co-operating inner surface portion of said stator, said baffle defining a constricted passage between the discharge and intake chambers, which passage has a mean diameter such that the hydraulic thrusts exerted axially by the working liquid on the inner and outer surfaces of said rotor shell are in equilibrium; and

an annular gasket borne by one of said rotor and said stator, the other of said rotor and stator having a rigid bearing surface in sliding contact with said gasket, the contact between said gasket and rigid bearing surface being the sole contact between said stator and rotor;

in which retarder the improvement comprises said apertured structure comprising:

lugs secured to one of said stator and said housing; and

a toothed ring secured to the other of said stator and housing;

said lugs and ring mounting said stator for rotation relative to said housing from a normal assembled position of said stator on said housing;

said ring having teeth co-operating with said lugs to hold said stator centred on the axis of said shaft end irrespective of the angular position of said stator;

said ring having recesses between said teeth enabling an endless belt on said pulley to be exchanged by threading of the belt through the recesses and rotation of the stator through an angle.

3,955,655

ADJUSTABLE LIQUID-OPERATED SHOCK-ABSORBER

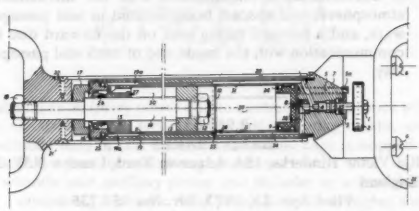
René Pornin, Les Allees, Arthez-de-Bearn, France

Continuation-in-part of Ser. No. 341,879, March 16, 1973, abandoned. This application Dec. 16, 1974, Ser. No. 533,061

Claims priority, application France, Mar. 17, 1972, 72.09344

Int. Cl.² F16F 9/19

U.S. Cl. 188—313 **6 Claims**



1. A liquid operated shock absorber, comprising: a sealed external casing; a sealed internal cylindrical casing fixed within said external casing, and spaced therefrom to define a longitudinal space between the inner wall of the external casing and the outer wall of the internal casing; said internal casing having opposite first and second ends and a first and a second end region near the respective said end; a main piston in continuous liquid sealed engagement with and located in said internal casing and dividing said internal casing into first and second chambers which are, respectively, on the sides of said piston facing said first and second ends of said internal casing; shifting means for shifting said sealed piston along said internal casing between said end regions; said shifting means for shifting said piston comprises a spindle attached to said piston and extending away from one side of said piston and through said first chamber of said internal casing and sealingly passing through said first end of said internal casing, whereby said spindle occupies volume in said internal casing first chambers; a first conduit passing through said internal casing at a location in said first end region and joining said internal casing first chamber with said longitudinal space between said casings; a second conduit passing through said internal casing at a location in said second end region and joining said internal casing second chamber with said space; said shifting means shifting said piston but not past said locations at which said first and said second conduits pass through said internal casing; and means in said internal casing for blocking said piston from moving past these said locations; a continuous, open, flow path being defined between said first and said second chambers, through said first conduit, said longitudinal space and said second conduit, such that flow can be in either direction through said flow path without overcoming any spring biased pressure resistance to flow in either direction; flow regulating valve means in said flow path for selectively closing off said path to the same predetermined extent to flow in

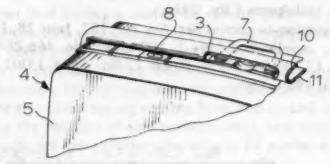
either direction; said flow path being interruptable only by said valve means for purposes of controlling flow; said valve means being capable of fixed positioning, without being shiftable due to pressure variations in said flow path; volume compensation means in liquid sealed engagement with and located in said internal casing second chamber for adjusting the volume of said second chamber according to variation in the volume of said first chamber due to said spindle moving in and out of said first chamber through said internal casing first end.

3,955,656

ELASTIC COVER AND SEAL FOR PROTECTING LUGGAGE

Albert A. Kashinski, 1914 N. Ode St., Apt. 4, Arlington, Va. 22209

Filed Aug. 30, 1974, Ser. No. 501,860
Int. Cl.² A45C *3/00*
U.S. Cl. 190—41 R **20 Claims**



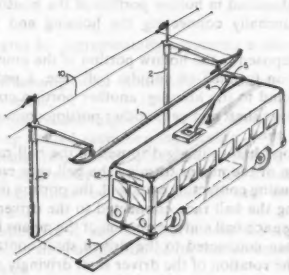
1. In an article of luggage having:
two substantially hollow, opposing, mated shells with side body portions and adjoining peripheral side portions,
means for fastening the shells in a closed, mated relationship to define a closure joint in the area of the peripheral side portions, and
a handle for carrying the luggage from place to place,
the improvement comprising:
a band of impervious material overlying substantially the entire closure joint and covering the peripheral side portions in the area adjacent to the closure without covering the side body portions to any substantial extent,
the band having elastic properties at least in the direction of, and substantially over, its entire length.

3,955,657

ELECTRIC TRACTION TRANSPORTATION SYSTEM WITH STORAGE BATTERY POWERED VEHICLES AND FAST RECHARGE AT THE VEHICLE STOPS

Oscar Bossi, Viale Lunigiana, 16, Milan 20125, Italy

Filed Feb. 15, 1974, Ser. No. 442,881
Int. Cl.² B60L *1/00*
U.S. Cl. 191—2 **7 Claims**



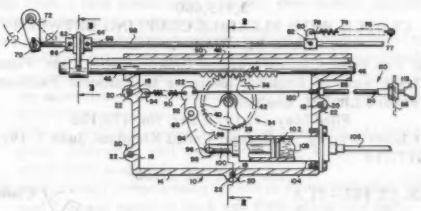
1. A vehicle for an electrical traction passenger transportation network having a plurality of stop stations for loading and unloading passengers, said stop stations being other than terminals, at least some of said stop stations being recharge stop stations provided with contact means for connecting a vehicle to an electric power line, and stretches between successive recharge stop stations, said vehicle stopping a relatively short stop time of the order of tens of seconds, normally not exceeding 1 minute, at each recharge stop station and consuming an amount of energy while running each stretch in between successive recharge stop stations, said vehicle comprising:
electric motor traction means;
storage battery means having a storage capacity sufficient to store the maximum amount of energy required to drive said vehicle over a stretch between successive recharge stop stations, said battery means having a nominal loading current; and
circuit means, including fast connection means for connecting said storage battery means to said contact means at a recharge stop station with a connection time permitting fast recharging of said battery means for substantially all of said stop time, for providing said battery means with fast recharging current from said power line which is of the order of several tens times the magnitude of said nominal current, including as much as the order of 100 times said nominal current, and of sufficient magnitude that said maximum amount of energy will be stored in said battery means during said relatively short stop time.

3,955,658

BRAKE CONTROLLED THROTTLE HOLDER

Antonio B. Bustmante, 1633 W. Belfast, Mesa, Ariz. 85201

Filed Nov. 18, 1974, Ser. No. 524,631
Int. Cl.² B60K *29/02*
U.S. Cl. 192—3 T **6 Claims**



1. In a vehicle engine speed control device the combination of: a frame adapted to be mounted in juxtaposition relative to an engine having a conventional moveable speed control member such as a carburetor throttle valve; a reciprocable member reciprocably mounted on said frame; guide means in said frame engagable by said reciprocable member; first means coupled to said reciprocable member for translating linear motion to pivotal motion; a pivotal member coupled to and operated by said first means; said pivotal member stationarily pivotally mounted on said frame; said pivotal member having an arcuate portion provided with buttress teeth; a latch pawl stationarily pivoted on said frame; a spring connected to said frame and said latch pawl and urging said latch pawl toward buttress engagement with said teeth for holding said pivotal member against pivotal movement in one direction; second means disposed to couple said reciprocable member to said speed control member whereby movement of said speed control member moves said reciprocable member which actuates said first means and pivots said pivotal member; and non-manual power operated means mounted on said frame and disposed for response to operation of vehicle brake and operation of said latch pawl and adapted to force it in a direction to release it from said buttress teeth.

3,955,659

CLAMPING ROLLER FREE-WHEELING DEVICE ESPECIALLY FOR THE GUIDE WHEELS OF HYDRODYNAMIC TORQUE CONVERTERS

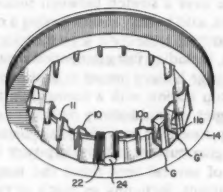
Fritz Ehret, Fellbach; Otto Wörner, Reutlingen, and Ulrich Juskowiak, Stuttgart, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Aug. 26, 1974, Ser. No. 500,711

Claims priority, application Germany, Aug. 28, 1973, 2343289

Int. Cl.² F16D *41/06*

U.S. Cl. 192—45 **16 Claims**



1. A gripping roller free-wheeling device comprising an elastic support of gripping rollers on cross tongues of a cage means, said cage means being formed by a ring means disposed adjacent the gripping rollers, the tongues being stamped out of the ring means and being bent along a bending edge approximately at right angle to the plane of the ring means, characterized in that at least two ring means are used which are offset to one another in such a manner that the tongues of one ring means are able to pass through the openings remaining in the other ring means after completion of the stamping and bending-out operations.

3,955,660

CLUTCH WITH FLEXIBLE COUPLING BETWEEN RELEASE BEARING AND LEVERS

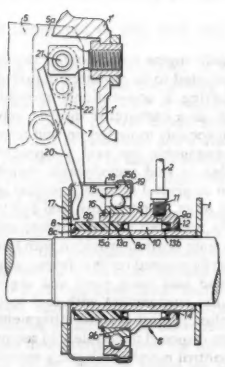
Sui Yun Poon, Chelmsford, and George Albert Tune, Pontefract, both of England, assignors to Ransome Hoffmann Pollard Limited, England

Filed May 31, 1974, Ser. No. 475,106

Claims priority, application United Kingdom, June 1, 1973, 26177/73

Int. Cl.² F16D *25/08*

U.S. Cl. 192—91 A **7 Claims**



1. A motor vehicle clutch release bearing and actuating mechanism comprising in combination a housing member, a clutch-disengaging device including a plurality of clutch release levers, a rolling-element thrust bearing and a hydraulically operated actuating device, said clutch-disengaging device being actuable, via said rolling-element thrust bearing, by said hydraulically operated actuating device, said hydraulically operated actuating device comprising a pair of coaxial stepped cylindrical members which define an annular chamber therebetween, the outer of said cylindrical members being slidable over the inner of said cylindrical members, said inner cylindrical member being fast to said housing member, wherein the inner ring of said rolling-element thrust bearing is fast to said outer cylindrical member and the outer ring of said rolling-element thrust bearing is flexibly coupled, by a coupling member, to said clutch release levers of said clutch-disengaging device so as to rotate therewith, said coupling member having the capability of flexing radially with respect to the axes of said rolling-element thrust bearing.

3,955,661

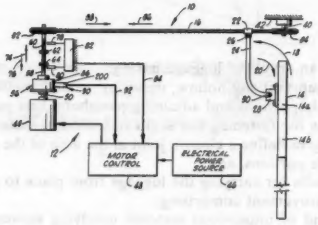
APPARATUS FOR OPENING AND CLOSING DOOR MEMBERS AND THE LIKE

Jakhim B. Popper, Kiryat Motzkin, Israel, and Riza E. Murteza, Oklahoma City, Okla., assignors to LSB Industries, Inc., Oklahoma City, Okla.

Continuation-in-part of Ser. No. 267,182, June 28, 1972. This application May 2, 1974, Ser. No. 466,280

Int. Cl.² F16D *11/04*; F16H *13/06*; E05F *15/02*, *15/00*

U.S. Cl. 192—150 **10 Claims**



1. Torque responsive apparatus, sensing the torque applied to a driven shaft, comprising:

a driver shaft, having opposite ends;

a driver connected to one end of the driver shaft drivingly rotating the driver shaft in a first direction of rotation;

a housing having a hollow portion formed in a portion thereof, the end of the driver shaft, opposite the end connected to the driver, extending through a portion of the housing and being disposed in the hollow portion of the housing;

means journally connecting the housing and the driver shaft;

a driven shaft, having opposite ends, one end of the driven shaft extending through a portion of the housing and being disposed in hollow portion of the housing;

means journally connecting the housing and the driven shaft;

means disposed in the hollow portion of the housing having a portion forming an annular ball race, a portion being connected to the housing, another portion connected to the driver shaft and yet another portion connected to the driven shaft;

at least one ball rollingly disposed in the ball race and the portion of the means forming the ball race connected to the housing contacting each ball, the portion of the means forming the ball race connected to the driver shaft contacting each ball and the portion of the means forming the ball race connected to the driven shaft contacting each ball, the rotation of the driver shaft drivingly rotating the driven shaft via each ball and the portions contacting each ball; and

a torque control having a portion connected to the housing sensing the rotational movement of the housing, the rota-

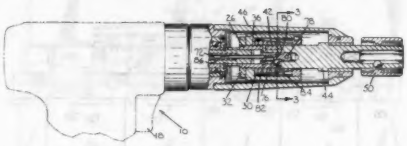
tional movement of the housing indicating the torque applied at the driven shaft.

3,955,662

TORQUE LIMITING WRENCH

Clyde David Thackston, Columbia, S.C., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Dec. 19, 1974, Ser. No. 534,236
Int. Cl.² F16D *43/20*, *7/02*
U.S. Cl. 192—150 8 Claims



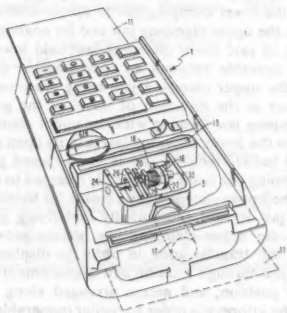
1. A power tool having a motor, an output shaft for transmitting rotation to a tool bit; and a torque-limiting assembly comprising adjustable torque transmitting means with a driving member, a co-axial driven member, a helical spring frictionally connecting said driving member and said driven member, the wire size of the spring varying from end-to-end, means for adjusting the position of said spring axially, and automatic shut-off means for interrupting the supply of power to said motor.

3,955,663

INCREMENTAL ADVANCE MECHANISM

Mario Enrique Ecker, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1974, Ser. No. 535,316
Int. Cl.² B41J *13/03*
U.S. Cl. 197—127 R 19 Claims



1. Apparatus for incrementally advancing a sheet comprising:

a sheet-advancing roller mounted for rotation;

actuator means;

reciprocating means responsive to said actuator means for providing limited reciprocating motion;

clutch means responsive to said reciprocating means for rotating said roller unidirectionally for a desired increment determined by the motion of said reciprocating means; and

means responsive to said actuator means for engaging said sheet upon the completion of the incremental motion of said sheet;

said actuator means comprising:

a solenoid containing a segmented plunger, one segment connected to said reciprocating means, the other segment connected to said sheet engaging means;

one of said segments containing a slot and the other of said segment keyed into said slot, the length of said slot being greater than the length of said key;

said segments being undercut at adjacent ends to increase the magnetic reluctance therebetween;

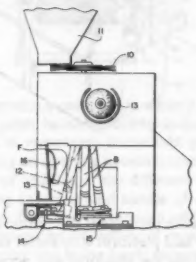
whereby said segments are capable of differential displacement depending on the difference between the respective lengths of said slot and said key.

3,955,664

APPARATUS FOR THE TRANSFER AND ALIGNMENT OF BOBBINS

Thomas E. Pitts, Cranston, R.I., assignor to Leesona Corporation, Warwick, R.I.

Continuation of Ser. No. 424,160, Dec. 12, 1973, abandoned.
This application Apr. 21, 1975, Ser. No. 570,262
Int. Cl.² B65G *47/00*
U.S. Cl. 198—24 5 Claims



1. Apparatus for the transfer of bobbins along a common path from a first position to a second downstream position removed therefrom comprising,

a plate having a bobbin receiving portion pivotable about an upstream axis from an initial bobbin engaging position to a subsequent depressed position inclined with respect to the downstream direction for tilting a bobbin towards said downstream direction and

a follower member supported by said plate and adapted to pivot therewith, said member having a hook portion offset from said plate, and

a continuously reciprocating means to move said plate and said follower member back and forth along said path,

said reciprocating means engageable with said hook portion to move said plate and said follower member in the downstream direction when said plate is in said depressed position and engageable with said plate to return said plate and follower member to their upstream position.

3,955,665

AUTOMATIC WEIGHING AND LABELING MACHINE

Charles R. Pettis, Jr., and Victor Del Rosso, both of Ithaca, N.Y., assignors to Hi-Speed Checkweigher Co., Inc., Ithaca, N.Y.

Filed Dec. 26, 1974, Ser. No. 536,301
Int. Cl.² G01G *13/30*
U.S. Cl. 198—39 9 Claims

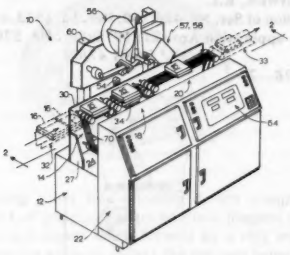
1. An apparatus for processing a package presented to a processing station at a given transport speed, which comprises:

processing means arranged within said processing station and including a platform on which said package is to be positioned during processing thereof and processing apparatus to effect said processing;

continuously driven conveying means for transporting said package to and from said processing station at a given transport speed and having a portion above said platform

movable between package receiving-discharge and processing positions disposed above and below said platform, respectively;

actuator means connected with said portion of the conveying means for lowering said portion to said processing position while transiently decelerating the speed of said portion to a value less than said given transport speed and for raising said portion to said receiving-discharge position while transiently accelerating the speed of said portion to a value greater than said given transport speed,



whereby each package is decelerated and deposited transiently on said platform whereafter the deposited package is lifted from the platform and accelerated by said portion; and

control means connected with said actuator means and said processing apparatus for causing said actuator means to cycle through the lowering and raising of said portion of the conveyor means and for causing the processing apparatus to effect said processing while a package is deposited on said platform.

3,955,666

SINGLE-CHAIN SCRAPER CONVEYOR

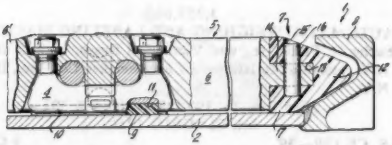
Ernst Braun, and Gert Braun, both of Essen-Heisingen, Germany, assignors to Halbach and Braun, Germany

Filed Oct. 3, 1974, Ser. No. 511,697

Claims priority, application Germany, Oct. 23, 1973, 2353005

Int. Cl.² B65G *19/00*

U.S. Cl. 198—168 **7 Claims**



1. A single-chain conveyor comprising a conveyor trough having a bottom with side walls having recessed guide faces, a chain running in said conveyor trough, a chain bracket connected to said chain and having a portion extending below said chain, a pusher connected to said chain over said bracket and having side arms engageable in respective side wall guide faces, said chain bracket having a plastic slide surface portion engageable over said bottom.

3,955,667

ENDLESS CONVEYOR WITH GRIPPING ELEMENTS

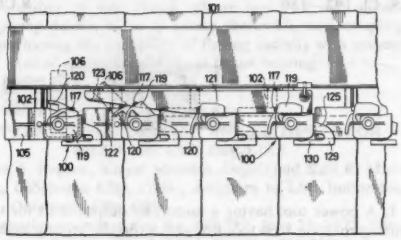
Erwin Müller, Durnten, and Werner Honegger, Ruti, both of Switzerland, assignors to Ferag AG, Hinwil, Switzerland

Filed May 27, 1975, Ser. No. 580,899

Claims priority, application Switzerland, May 28, 1974, 7233/74

Int. Cl.² B65G *19/00*

U.S. Cl. 198—180 **18 Claims**



1. A transport apparatus for products, especially printed products arriving in an imbricated product formation, comprising a revolving traction element, grippers for engaging the leading edges of the printed products and for seizing the same for the further transport thereof, means for mounting said grippers in spaced relationship from one another at said revolving traction element for movement in a predetermined direction of travel, means defining a conveying path for the imbricated product formation for movement in a predetermined direction of travel, guide means for guiding said grippers, said means defining said conveying path for the imbricated product formation and said guide means for the grippers extending towards one another at a transfer zone for the imbricated product formation, each gripper comprising an upper clamping jaw and a lower clamping jaw, means for mounting the lower clamping jaw to be movable towards and away from the upper clamping jaw and for enabling rotational movement of said lower clamping jaw, said lower clamping jaw being movable between an open position and a closed position, the upper clamping jaw being rearwardly directed with respect to the direction of travel of the grippers, said lower clamping jaw forming with the upper clamping jaw an angle when the lower clamping jaw is in its open position and when said lower clamping jaw is in its closed position said lower clamping jaw being positionally oriented to substantially underlie the upper clamping jaw, means for holding the lower clamping jaw in said substantially underlying position with regard to the upper clamping jaw, means provided at the region of the transfer zone in order to displace the lower clamping jaw through rotation and displacement thereof into its closed position, and means arranged along the path of travel of the grippers in order to render inoperable the holding means and to return the lower clamping jaw back into its open position.

3,955,668

APPARATUS FOR DISCHARGING MATERIAL TO A LOCATION

Floyd F. Buschbom, Long Lake; Glen D. Hansen, Maple Plain, and Walter W. Wolfe, Mound, all of Minn., assignors to Veda, Inc., Long Lake, Minn.

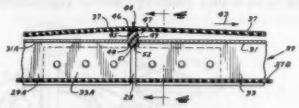
Division of Ser. No. 436,901, Jan. 28, 1974, Pat. No. 3,902,592. This application Mar. 7, 1975, Ser. No. 556,269

Int. Cl.² B65G *15/60*

U.S. Cl. 198—188 **17 Claims**

13. A material handling apparatus comprising: a plurality of end-to-end elongated support members, each support member having a first end and a second end, a first end of a first support member being located adjacent the second end of a

second support member when the first and second support members are located in end-to-end position, an elongated belt movably located on said support members for carrying material, a belt engaging member located between said first and second ends of the first and second support members, said belt



engaging member having means for mounting the belt engaging member on the first and second ends of the first and second support members, said belt engaging member having a portion projected away from the support members and engageable with a separate portion of the belt to elevate said separate portion of the belt from the support members.

3,955,669

CONDUIT MEANS FOR A VIBRATORY CONVEYOR

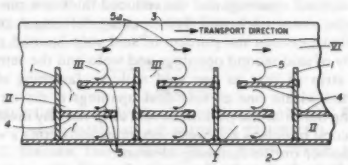
Karl Homilius, Nieder-Ramstadt; Fritz Stoff, Darmstadt; Heinz Saettler, Geroldsheim, and Wolfgang Scharmer, Darmstadt-Arheilgen, all of Germany, assignors to Carl Schenck AG, Darmstadt, Germany

Filed May 13, 1974, Ser. No. 469,614

Claims priority, application Germany, May 18, 1973, 2325254

Int. Cl.² B65G *27/00*

U.S. Cl. 198—220 BA **19 Claims**



1. In a vibratory conveyor conduit means for transporting bulk material at elevated temperatures in a given transport direction in the conduit means by vibratory movement thereof, wherein the conduit means has a bottom wall and a pair of side walls extending in said given direction; the improvement comprising a plurality of partition plates extending substantially across said conduit means between the side walls thereof and transversely of said transport direction, said partition plates extending through only a portion of the height of said conduit means at the bottom thereof beneath the surface of the bulk material transported therein, said partition plates dividing the bottom of said conduit means into separate compartments, and a layer of insulating material in each of said compartments to form a substantially continuous insulating layer on said bottom wall in the conduit means, said partition plates holding said insulating material in said compartments against movement out of said compartments.

3,955,670

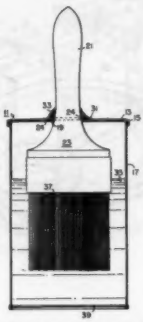
PRESERVATION OF PAINT BRUSH

David Buslik, 273 Outlook Ave., Youngstown, Ohio 44504

Filed May 14, 1975, Ser. No. 577,611

Int. Cl.² A45D *44/18*; B65D *81/24*

U.S. Cl. 206—15.3 **5 Claims**



1. For use in preserving a paint brush while it is stored after it has been used, a paint brush holder including a lid tightly fitting a can which in customary household practice is discarded, said lid having an opening accommodating the handle of one of a number of brushes of the different sizes normally encountered, a spring engaging said handle of said brush and suspending said brush from the lid through said opening, said spring being of a dimension exceeding a cross-sectional dimension of said opening and being freely suspended over said opening on the surface of said cover, physically unattached to said cover, and adhesive tape adhered to the handle of said brush and to said cover sealing the portion of said opening about said handle.

3,955,671

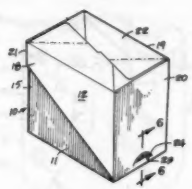
SHIPPING AND DISPLAY CARTON

Gary B. Ockey, San Francisco, Calif., assignor to The Clorox Company, Oakland, Calif.

Filed Jan. 16, 1975, Ser. No. 541,405

Int. Cl.² B65D *5/50*, *85/62*

U.S. Cl. 206—44 R **8 Claims**

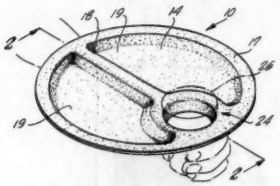


1. A carton for shipping and displaying a plurality of packets or the like comprising an open-top carton member, and a second carton member configured to fit over the open top of the first carton member in telescopic relation with the first carton member to form a carton therewith, one of said first and second carton members defining tab means, the other of said first and second carton members defining slot means positioned to mate with said tab means, with the first and second carton members forming said carton, to lock the first and second carton members together and prevent relative telescopic separation thereof, and wherein one carton member is provided with means defining an axis whereby one of said carton members may be rotated about said axis relative to the other of said carton members to disengage the tab means from the slot means.

3,955,672
PLATE ASSEMBLY

Keene N. Brundage, 13827 Sunset Drive, Whittier, Calif. 90602

Filed Feb. 28, 1975, Ser. No. 554,199
Int. Cl.² B65D 1/36; A47G 23/06
U.S. Cl. 206—72 6 Claims

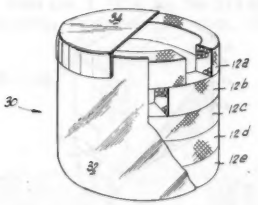


1. A plate assembly capable of being supported and balanced on the forearm of the user comprising:
a body having a food bearing surface and a support surface, said support surface having a channel formed therein for receipt of the forearm of the user; and
a cup support member integrally formed with said body and protruding into said channel to the plane defined by said support surface to enable level positioning of said assembly on a flat surface, said cup support member forming a grasping means for balancing the plate assembly when it is resting on the forearm of the user and said support member being open at both ends.

3,955,673
ROTARY SHAFT PACKING REPLACEMENT KIT

Donald Edson Fosness, Bellevue, Wash., assignor to Johns-Manville Corporation, Denver, Colo.

Filed Nov. 18, 1974, Ser. No. 524,428
Int. Cl.² B65D 71/00, 85/02, 85/58
U.S. Cl. 206—318 2 Claims

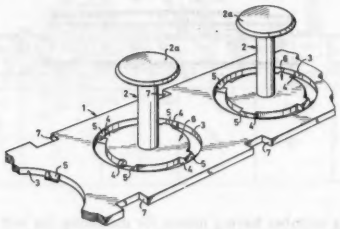


1. A repacking kit for the replacement of mechanical packing surrounding a rotating shaft which comprises a plurality of preformed, oversized circular split rings, each of which has a configuration with an inner diameter approximately the same as the maximum diameter of the shaft to be sealed and a length greater than the circumference of the maximum diameter shaft to be sealed, said configuration being such that when each ring is initially placed in position on a shaft the ring assumes a helical configuration with its ends overlapping for simultaneous severing of both ends along a single line.

3,955,674
MAGAZINE FOR A FASTENING ELEMENT SETTING GUN

Elmar Maier, Feldkirch-Tisis, Austria, and Robert Tilg, Schaan, Liechtenstein, assignors to Hilti Aktiengesellschaft, Liechtenstein

Filed Dec. 10, 1974, Ser. No. 531,439
Claims priority, application Germany, Dec. 17, 1973, 7344665
Int. Cl.² B65D 85/24; F16B 15/00
U.S. Cl. 206—347 6 Claims



1. A magazine for supporting fastening elements for use in an explosive charge driven setting gun comprising a plurality of nail-like headed fastening elements each having a tip end and a headed end, a flat elongated strip having a pair of laterally spaced longitudinally extending edges, said strip having a plurality of first openings therein spaced apart in the elongated direction of the strip and each said first opening arranged to hold one of said fastening elements at a position spaced from the headed end of the fastening element, a plurality of second openings formed in said strip about each said first opening, said second openings being spaced radially outwardly from and extending partly around each said first opening and spaced inwardly from the longitudinally extending edges of said strip, wherein the improvement comprises webs formed in said strip extending radially relative to said first openings and disposed between and separating the adjacent said second openings about each said first opening, at least a portion of each said web having a reduced thickness as compared to the thickness of said strip and the combination of said second openings and the reduced thickness portion of said webs about each said first opening defining a ring-like separation between the portion of said strip located radially inwardly of said second openings and webs and the remainder of the strip so that as one said nail-like fastening element supported within one of said first openings is driven into a receiving material the portion of said strip radially inwardly of said second openings and webs separates and forms a washer-like member on the fastening element.

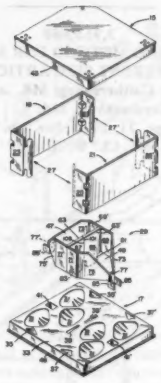
3,955,675
ONE-PIECE INTERNAL SUPPORT FOR A CATHODE RAY TUBE MULTIPACK CONTAINER

Joseph M. Kurtz, Ottawa, Ohio, assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Apr. 16, 1975, Ser. No. 568,520
Int. Cl.² B65D 85/42, 5/10
U.S. Cl. 206—419 7 Claims

1. An improvement in the supportive means for accommodating and protecting a pair of cathode ray tubes positioned in opposed orientation upon a substantially rigid tray-like closure member having a plurality of spatially oriented cavities formed therein to receive portions of the panel and funnel areas of said tubes, with the longitudinal axes and neck portions of said tubes being substantially parallel with said closure member, and wherein said closure member has a plurality of recesses to facilitate securement of said tube protective means thereon, said improvement comprising:

supportive means having integral first and second tube protective compartments adapted for substantially encompassing the panel and funnel portions of said cathode ray tubes, said compartments being formed from a one piece unitary sheet of substantially rigid material utilizing a series of predefined folding scores therein to provide a plurality of upstanding opposingly oriented side walls and a related plurality of upstanding opposingly oriented end walls, one of said end walls of said first compartment being a primary wall formed of two juxtapositioned componental parts placed in back-to-back alignment with a correspondingly formed primary end wall of said second



compartment thereby defining a dual-wall terminally-joined separation member for separating said first and second compartments, the other of said upstanding end walls of each of said compartments being an opposed secondary wall and having a cut out region therein for accommo dating the extended neck portions of said respective tubes; and

a plurality of tabular elements extending from the lower edges of said upstanding opposingly oriented end-walls of said compartments shaped for placement in said recesses formed within said closure member to effect positional attachment of said improved supportive means upon said closure member.

3,955,676

ADJUSTABLE SHIPPING RACK AND MEANS FOR SECURING FLAT SHEETS THERETO

Ralph C. Hansen, Toledo, Ohio; Rae E. Vande Water, Jackson, and Owen W. Sherwin, Spring Harbor, both of Mich., assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Division of Ser. No. 384,620, Aug. 1, 1973, Pat. No. 3,878,942. This application Sept. 20, 1974, Ser. No. 507,891

Int. Cl.² B65D *85/48*

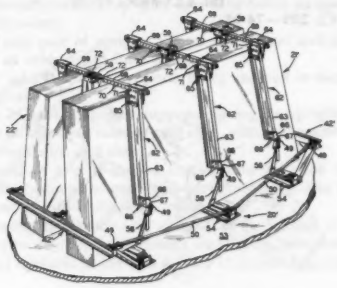
U.S. Cl. 206—451 **6 Claims**

1. In a shipping rack for transporting two groups of flat sheets in a spaced, generally vertical position on their longitudinal edges, and having at least a pair of interconnected A-frame sections, each said section including a transverse horizontal base and angularly disposed outwardly facing L-shaped sheet supporting surfaces, the improvement comprising:

a. at least a pair of vertically spaced anchor means fixedly secured to each said A-frame section wherein one of said anchor means is positioned at the top of said A-frame section and the other of said anchor means is positioned intermediate the ends of said base;

b. an elongated substantially rigid brace member extending across the outer face of an associated group of sheets and between said pair of anchor means; and

c. means fastening one end of said brace member to said top anchor means and the other end of said brace member to



said base anchor means, said fastening means including additional means urging said brace member against the outer face of the associated group of sheets.

3,955,677

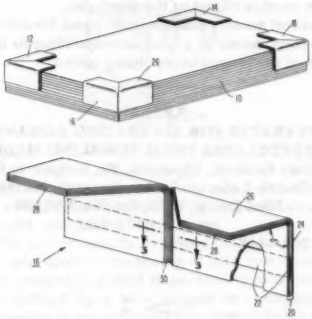
CORNERBOARD PROTECTOR

David S. Collingwood, Bridgeport, Pa., assignor to Cornerboard, Inc., Bridgeport, Pa.

Filed June 3, 1974, Ser. No. 475,520

Int. Cl.² B65D *25/12, 81/06*

U.S. Cl. 206—453 **6 Claims**



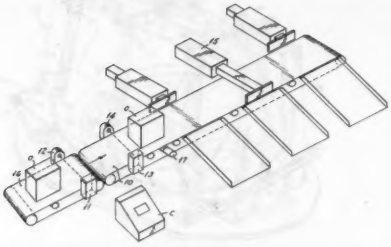
1. Corner protector comprising a strip of resilient, laminated cardboard having an inner and an outer surface and a flexible reinforcement strip along the length thereof embedded between the laminae of said strip near the outer surface of said laminated cardboard said strip being bent all of said laminae toward the inner surface thereof in a line along its length, said cardboard being cut, on the inner surface thereof in the unbent portion thereof through substantially all of said laminae to said reinforcement strip near the outer surface thereof, said cut being made along a line at an angle to the length of said strip, the sides of said cut forming a V-shape with the apex pointing away from said inner surface, said bent portion being cut through all of said laminae along lines continuous with the sides of said V-shaped cut in said unbent portion.

3,955,678

SORTING SYSTEM

Ernest P. Moyer, Frederick, Md., assignor to American Chain & Cable Company, Inc., Bridgeport, Conn.

Filed Aug. 9, 1974, Ser. No. 496,316
Int. Cl.² B65G 47/30
U.S. Cl. 209—74 M 8 Claims



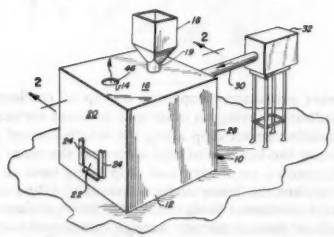
1. In a conveyor sorting system, the combination comprising
a conveyor for moving objects along a predetermined path,
a plurality of means for diverting objects at longitudinally spaced points along the conveyor,
induction means for introducing objects to one portion of the conveyor for movement by the conveyor to said diverter means,
means for sensing objects moving along said conveyor,
synchronizing means producing clocked pulses at a rate corresponding to the surface displacement of the conveyor,
and control means responsive to said sensor means and said synchronizing means for producing a timing puise thereby indicating the location of said object relative to said induction means and said diverter means, and for producing a signal for activating said induction means to introduce another object to the conveyor,
said control means producing said signal for activating said induction means at a time corresponding to the trailing edge of the longest object being sorted.

3,955,679

APPARATUS FOR SEPARATING REMANENT REEDBLADES FROM TUMBLING MEDIA

Bodo Gustav Gebauer, Algonquin, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Jan. 6, 1975, Ser. No. 538,654
Int. Cl.² B07B 9/00
U.S. Cl. 209—115 4 Claims



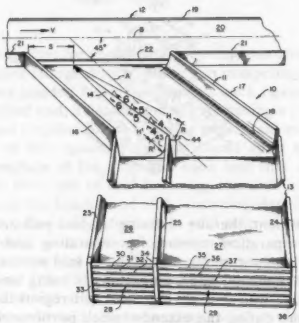
1. Apparatus for separating articles, all having predetermined aerodynamic characteristics, from a mixture including randomly shaped particles, comprising:
a separator assembly including a funnel having first and second ports at opposing ends thereof, said first port being smaller than said second port, a tubular neck connected at one end to said first port, a diffuser of generally tubular shape, having a plurality of holes spaces about its perimeter, connected to the other end of said tubular neck;
hopper means for loading such a mixture into said second port of said funnel;
a housing having a diagonally bisecting plate to form a first chamber and a second chamber;
means for mounting said separator assembly in said housing with said funnel in said first chamber and said diffuser in said second chamber; and
means for connecting said second chamber to a source of fluid pressure of a predetermined amplitude.

3,955,680

APPARATUS AND METHOD FOR SEGREGATING DIFFERENT SIZE ARTICLES

Bernard C. Botula, Gaithersburg, Md., assignor to Fairchild Industries Inc., Germantown, Md.

Filed Sept. 21, 1973, Ser. No. 399,483
Int. Cl.² B07C 1/00
U.S. Cl. 209—116 6 Claims



1. An apparatus for segregating different size articles with an inclined chute and means located adjacent to the upper end of the chute for causing the articles to be segregated to be moved onto the upper end portion of the chute, wherein the improvement comprises segregating means located on said chute for impacting with at least some of the articles which are to be segregated and for segregating the articles as a function of article size and velocity, said segregating means including an elongated protuberance having at least one inclined side surface for coming into contact with at least some of the articles being segregated, a second inclined chute having its upper end portion located adjacent to the lower end portion of said first chute, said second chute being inclined at a lesser angle than said first chute, means located in said second chute for keeping the articles which have been separated confined to separate portions of said second chute, and separate gate means located at the lower end portion of said second chute for retaining the separated articles in separate portions of the lower end of said second chute.

3,955,681

ARTICLE RETAINER FOR STACKED ASSEMBLY

Theophile L. DeZinno, Miami, Fla., assignor to Plastic Graphix Corporation, Miami, Fla.

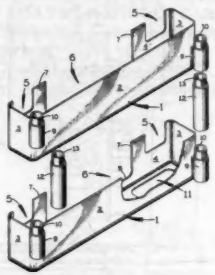
Filed Mar. 3, 1975, Ser. No. 554,726
Int. Cl.² A47F 7/02
U.S. Cl. 211—13 10 Claims

1. An article retainer for stacked assembly with a plurality of identical other article retainers, said article retainer comprising:

a bottom and an upstanding rear wall which extends up from said bottom;

a first socket rigidly attached to said rear wall at one end of the latter, said first socket extending vertically for substantially less than full height of said rear wall and terminating at its lower end in a downwardly-facing shoulder which is spaced a predetermined distance above said bottom;

a second socket rigidly attached to said rear wall at the opposite end of the latter, said second socket extending vertically for substantially less than the full height of said rear wall and terminating at its upper end in an upwardly-



facing shoulder which is spaced above said bottom by substantially said predetermined distance;

one of said sockets having a vertical recess therein which is open at said shoulder on said one socket;

and a post rigidly attached to the other of said sockets and projecting vertically beyond the respective shoulder thereon, said post being shaped and dimensioned to be slidably insertable into said recess in said one socket on an adjoining identical article carrier to releasably interlock the two article carriers at the same level with their respective downwardly and upwardly-facing shoulders substantially contiguous to each other.

3,955,682

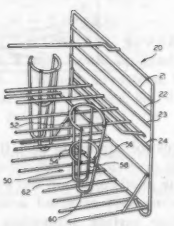
LABORATORY SHELF FOR FUNNEL-SHAPED GLASSWARE

Louis Baren, Chicago, Ill., assignor to Accurate Wirecraft Company, Chicago, Ill.

Continuation-in-part of Ser. No. 345,578, March 28, 1973, Pat. No. 3,858,835. This application Apr. 1, 1974, Ser. No. 456,656

Int. Cl.² B01L 9/00

U.S. Cl. 211—74 **3 Claims**



1. A wire frame shelf for funnel-shaped laboratory glassware with petcocks, comprising:

a plurality of horizontally displaced holders;

each of said holders comprising at least two vertically disposed concentric partial rings;

each of said partial rings being defined by a wire arcuate in configuration and terminating in spaced ends,

said ends defining vertically aligned slots,

a pair of depending U-shaped supports;

each of said U-shaped supports being formed of a pair of substantially vertical uprights spaced to define an opening therebetween;

each of said pair of uprights joined at its lower end to the other of said pair to form a bight;

each of said U-shaped supports being secured to each of said partial rings;

the first of said U-shaped supports having its uprights secured on opposite sides of said slots, with said opening in alignment with said slots;

the second of said U-shaped supports having each of its uprights fastened to each said partial ring opposite from the first of said U-shaped supports; and

said opening defined by said uprights of the second of said U-shaped supports in alignment with the opening defined by said uprights of the first of said U-shaped supports.

3,955,683

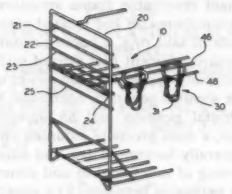
LABORATORY RACK AND SHELF FOR FUNNEL-SHAPED GLASSWARE

Louis Baren, Chicago, Ill., assignor to Accurate Wirecraft Company, Chicago, Ill.

Continuation-in-part of Ser. No. 456,656, April 1, 1974. This application Nov. 29, 1974, Ser. No. 528,569

Int. Cl.² B01L 9/00

U.S. Cl. 211—74 **7 Claims**



1. A wire frame shelf for funnel shaped laboratory glassware with petcocks, comprising:

a plurality of horizontally displaced holders,

each of said holders comprising at least two vertically disposed concentric partial rings, each of said partial rings being defined by a wire arcuate in configuration and terminating in spaced ends, said ends defining vertically aligned slots;

a pair of depending U-shaped supports, each of said U-shaped supports being formed of a pair of uprights spaced to define an opening therebetween,

each of said pair of uprights joined at its lower end to the other of said pair to form a bight,

the first of said pair of U-shaped supports having its uprights secured on opposite sides of said slots with said opening in alignment with said slots;

the second of said U-shaped supports having each of its uprights fastened to each said partial ring opposite from the first of said U-shaped support, said second of said U-shaped supports being further fastened to said shelf,

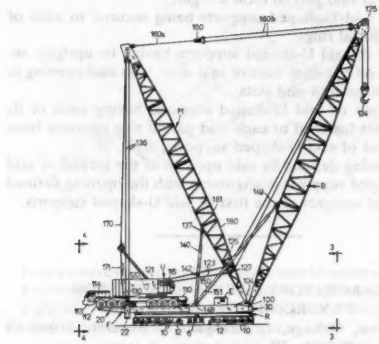
said first of said U-shaped supports and said second of said U-shaped supports depending slantingly to cross at a predetermined position, said first of said U-shaped supports and said second of said U-shaped supports being fastened together at said predetermined position.

3,955,684

ROTARY CRANE STRUCTURE WITH A SELECTIVE DRIVE ON POWER UNIT

Carl F. Novotny, Greenfield, Wis., assignor to Harnischfeger Corporation, Milwaukee, Wis.

Filed Feb. 6, 1975, Ser. No. 547,753
Int. Cl.² B66C 23/72
U.S. Cl. 212—48 **13 Claims**



1. A rotary crane assembly comprising; a ring supported generally horizontally on the ground, a frame structure revolvably mounted on said ring about a generally vertical axis, wheel assemblies to thereby permit rotation of said revolvable frame structure on said ring, power means for rotationally driving said frame structure in either direction, a power unit drivable onto said revolvable frame structure and secured thereto for rotation therewith and located generally over and adjacent one side of said ring, a boom pivotally mounted to said frame structure adjacent that side of said ring which is generally diametrically opposite to said power unit, said boom being swingable about a generally horizontal axis between a generally horizontal position and an upwardly extending working position, a mast pivotally mounted on said structure and about a generally horizontal axis and adjacent the point of pivotal mounting of said boom to said structure, said mast being vertically swingable between (1) a generally horizontal position where it can rest above said boom when the latter is in a horizontal position and (2) an upwardly extending working position, said power unit having power hoist means for said mast and boom for vertically swinging said mast and boom, and means for securing said mast and said boom to said structure in said working position.

3,955,685

APPARATUS FOR LINING A FURNACE

Joe H. Smith, Bluff Park, Ala., assignor to United States Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 253,217, May 15, 1972, Pat. No. 3,853,204. This application Feb. 15, 1974, Ser. No. 442,710
Int. Cl.² E04G 3/14
U.S. Cl. 214—1 H **35 Claims**

1. Apparatus for lining a furnace, provided with a bottom aperture in its bottom and a top aperture in its top, with an inner lining of a refractory material, said apparatus having:

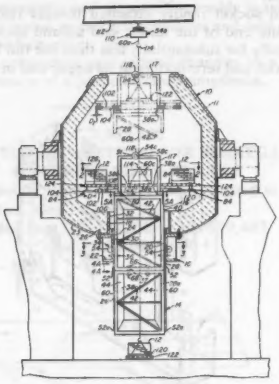
a. a table support member secured to said furnace adjacent said top aperture in said furnace;

b. a turntable rotatable on said table support member and provided with work platform elevating means clearance apertures;

c. a work platform movable through said bottom aperture in said furnace while in a storage position and then further movable from said storage position to a work position to enable a workman to stand on said work platform

1. said work platform being provided with a refractory material aperture;

d. work platform elevating means extending through said table support member, and operatively connected between said turntable and said work platform for moving said work platform through said bottom aperture in said furnace to a desired work position within said furnace;



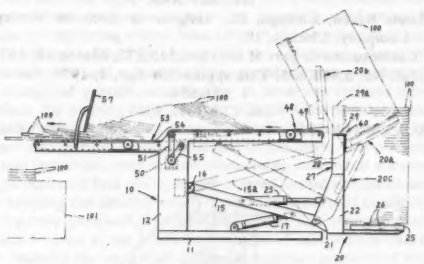
e. refractory material elevating means on said turntable extending through said table support member, and connectable to said refractory material for moving said refractory material through said refractory material aperture in said work platform so that said refractory material can be transferred from said refractory material elevating means to said work platform.

3,955,686

APPARATUS FOR SUPPLYING THIN, FLAT ARTICLES

Naoki Kumagai, Yokohama, Japan, assignor to Itogihan Company, Ltd., Tokyo, Japan

Filed Mar. 25, 1975, Ser. No. 561,996
Int. Cl.² B65G 59/08
U.S. Cl. 214—1 Q **4 Claims**



1. In an apparatus for supplying thin, flat articles having a reversing means for reversing the direction toward which said articles face while in piled condition and a conveyor means for receiving and feeding said reversed articles, said reversing means has a bottom surface supporting part and an edge supporting part disposed perpendicular to said bottom surface supporting part and is able to reverse said articles from a piled condition of said articles upon said bottom surface supporting part to a reversed condition of said articles on said edge supporting part by lifting and rotating said articles, said edge supporting part is able to return to the initial position by

passing downwardly through a supporting surface of said conveyor means after reversing of said articles, said edge supporting part of said apparatus comprises at least one fixed member which is fixed to said bottom surface supporting part and at least one sliding member which is slidably associated with said fixed member so as to change the length of said edge supporting part, said edge supporting part is able to pass through the supporting surface of said conveyor means at a stretched condition thereof after reversal of said articles and return to an initial position while becoming a contracted condition thereof.

3,955,687

APPARATUS FOR FEEDING WORKPIECES INTO WORK SPINDLES OF MULTIPLE-SPINDLE BAR MACHINES

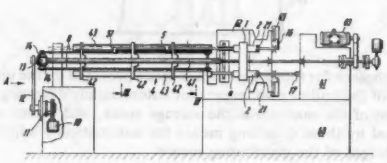
Hermann Flisch, Maienfeld, Switzerland, assignor to Eunipp AG, Zug, Switzerland

Filed Nov. 12, 1974, Ser. No. 523,371

Claims priority, application Switzerland, Dec. 18, 1973, 017714/73

Int. Cl.² B23Q *5/20*

U.S. Cl. 214—1.5 **12 Claims**



1. Apparatus for feeding elongated workpieces into hollow work spindles of a multi-spindle bar machine wherein the work spindles are parallel to each other and are mounted in an indexible spindle carrier, comprising a support coaxial and indexible with the carrier; a plurality of elongated tubular guides mounted in said support and each thereof being in register with a work spindle; a pusher reciprocably mounted in each of said guides; means for introducing elongated workpieces into said guides intermediate the respective pushers and work spindles; discrete drive means for each of said pushers, all of said drive means being mounted on and being indexible with said support and each thereof comprising a motion transmitting element connected with the respective pusher and being movable in two directions to thereby move the respective pusher forwardly and rearwardly in the respective guide; a common prime mover for all of said drive means; and a discrete friction clutch interposed between said prime mover and each of said drive means so that said prime mover can operate a first drive means while a second drive means is held at standstill.

3,955,688

ARTICLE HANDLING APPARATUS

John Clifford Jones, King's Lynn, England, assignor to FMC Corporation (U.K.) Limited, Brentford, England

Filed Mar. 19, 1974, Ser. No. 452,692

Int. Cl.² B65G *57/04*

U.S. Cl. 214—6 F **3 Claims**

1. An article-handling and transfer apparatus operable between a pick-up station located at one elevation and a receiving station located at a lower elevation, said apparatus comprising

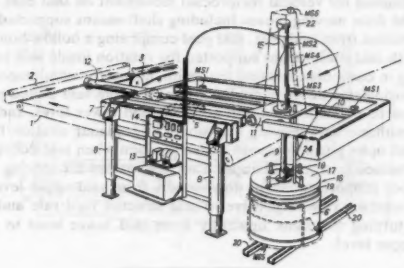
a transfer mechanism movable between the pickup and receiving stations to engage and transfer a group of articles, which are accumulated in a generally circular array at said pick-up station, to said receiving station while arranged in said generally circular array;

means for vertically moving said transfer mechanism;

a container at said receiving station;

said container being of circular form to receive a group of said articles arranged in said generally circular array and being of sufficient depth to hold a plurality of layers of said grouped articles; and

control means sequentially operable during vertical movement of said transfer mechanism for successively arresting movement of said transfer mechanism at pre-set appropriate levels in said container to create the plurality of



layers of grouped articles, said control means incorporating

switches arranged at heights adjustable to correspond with the depth of each layer and connected to produce the successive arrests of the transfer member as the number of layers of grouped articles increases;

the controlled successive arrests of said transfer mechanism serving to prevent damage, such as bending in the case of cans, to the articles.

3,955,689

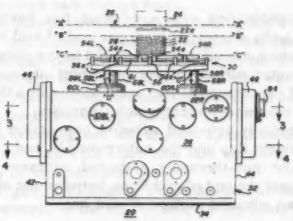
APPARATUS FOR ACCUMULATING STACKS OF SLICED MATERIAL

Gary Leonard Wallace, Oak Lawn, Ill., assignor to Chemetron Corporation, Chicago, Ill.

Filed Mar. 25, 1974, Ser. No. 454,263

Int. Cl.² B26D *4/46;* **B65G** *57/03*

U.S. Cl. 214—6 H **7 Claims**



1. Apparatus for making separate stacks of an adjustable selected number of thin flat slices of flexible material from a stream thereof comprising a succession of downwardly falling slices cut in sequence on a common cutting level from a mass of said material fed downwardly through said cutting level at an adjustable selected feed rate, said apparatus comprising a base, means for supportively accumulating successive falling slices into a stack of a selected number of slices and discharging said stack when said selected number of slices has been accumulated, said means including a pair of platform doors supported for simultaneous coplanar reciprocal movement toward and away from each other between a coplanar closed, accumulating position adjacent each other cooperatively supporting an accumulating stack of said slices and a coplanar open discharge position spaced apart from each other suffi-

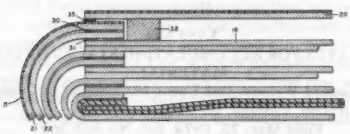
cient to pass and discharge a completed stack of slices between said doors, said apparatus including means supporting said doors for vertical reciprocal movement relative to said base between an upper level spaced below said cutting level and a selctively adjustable lower level spaced therefrom, said supporting means including a platform structure supporting said doors for reciprocal horizontal movement thereon to open and close and a vertical post assembly carrying said platform structure for vertical movement relative to said cutting level, said support post assembly including post means mounted for vertical reciprocaal movement on said base and said door moving means including shaft means supported for rotation from said post, said post comprising a hollow housing with said shaft means supported for rotation inside said housing in concentric relation therewith, means for simultaneously moving said doors in coplanar relation from said closed position to said open position adjacent said lower level, and for simultaneously moving said doors in coplanar relation from said open position to said closed position when said doors are returned toward said upper level, and means for moving said door supporting means downwardly from said upper level at a selected rate responsive to said selected feed rate and for returning the same upwardly from said lower level to said upper level.

3,955,690

DUNNAGE BAG END CLOSURE

Robert O. Baxter, Camden, Ark., assignor to International Paper Company, New York, N.Y.

Filed Sept. 23, 1974, Ser. No. 508,156
Int. Cl.² B65G *1/14*
U.S. Cl. 214—10.5 D **10 Claims**



1. In combination with a dunnage bag having opposed, multi-ply walls wherein at least one end of said bag is closed by flaps which are adhesively secured to the plies of one wall and the outer surface of the outermost ply and the outer surface of the outermost flap are coated with a thermoplastic material, the improvement which comprises:

a. a thermally activated adhesive connection between the outermost flap and the outermost ply; and

b. a first non-thermally activated adhesive connection, adjacent the end of said flaps, between the outermost ply and an adjacent portion of said bag.

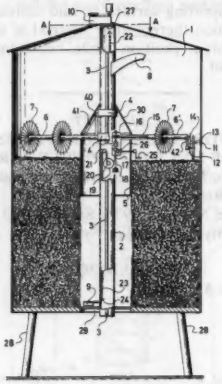
3,955,691

APPARATUS FOR FILLING AND DISCHARGING TOWER-SHAPED STORAGE SPACES

Jiri Zaruba; Josef Fruehauf; Jan Mikulik, and Bohumil Vodenka, all of Prague, Czechoslovakia, assignors to Stredisko pro vynalezy a zlepsovaci navrhy, Prague, Czechoslovakia

Filed Oct. 8, 1974, Ser. No. 513,047
Int. Cl.² B65G *65/32*
U.S. Cl. 214—17 CB **5 Claims**

1. Apparatus for filling and discharging tower-shaped storage spaces with solid material, comprising a vertical hollow central rotatable post in the tower-shaped storage space, said rotatable post serving for the supply of the material into the storage space, a piston coaxial of the post and slidable therealong progressively to form a central hollow space in the deposited solid material in the storage space, at least one slidable sleeve on the post connected to the piston for sliding therewith along the post, and at least one radially extending arm connected to the sleeve, a distributing device for the stored material supported on said radially extending arm, a



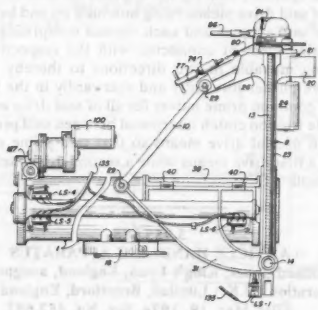
mouthpiece for filling the storage space provided on the upper part of the hollow post, means for automatically detecting the height of the material in the storage space, and means controlled by these detecting means for automatically adjusting the height of the distributing means.

3,955,692

HANDLING APPARATUS

John P. Cody, and James J. Kane, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed June 3, 1954, Ser. No. 440,579
Int. Cl.² B66C *17/08*; G21C *19/20*
U.S. Cl. 214—18 N **9 Claims**



1. A device of the character described comprising the combination of a guide tube having a normally open end, a support frame having a port therethrough, linkage means pivotally connected with the tube and with the frame and rotatably supporting the tube for movement between a position in longitudinal alignment with said port and with its open end in registry with the port and an additional position in which the tube lies adjacent the port with a side portion of the tube extending generally transversely across said port, an elongated track carried by said frame disposed generally parallel to and adjacent the tube in its said additional position, means con-

nected with and projecting laterally from said tube adjacent its open end engaging and movable along said elongated track for cooperating with the track to direct the tube during movement between said positions, and means carried by the tube for moving an article therethrough toward and away from said port.

3,955,693

METHOD AND APPARATUS FOR COOLING AND CLEANING THE SEALING SURFACE OF A VALVE

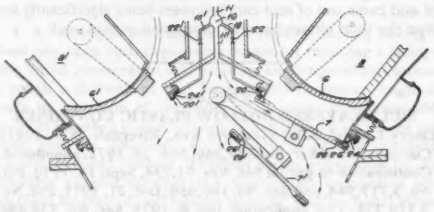
Edouard Legille, Luxemburg, and René N. Mahr, Howald-Hesperange, both of Luxemburg, assignors to S.A. des Anciens Etablissements Paul Wurth, Luxemburg, Luxemburg

Continuation-in-part of Ser. No. 398,312, Sept. 18, 1973, abandoned. This application June 26, 1974, Ser. No. 483,404

Claims priority, application Luxemburg, Sept. 20, 1972, 66125

Int. Cl.² F27B *11/12*; F16L *45/00*

U.S. Cl. 214—35 R **17 Claims**



1. A method for cooling and cleaning the sealing surfaces of the sealing valve of a material storage hopper, the hopper comprising a portion of a shaft furnace charging apparatus installed above the throat of the furnace, the method comprising the steps of:

introducing a gaseous cooling medium at a pressure in excess of the pressure existing in the throat of the furnace into the charging apparatus; and

continuously directing the thus introduced cooling medium to flow about the sealing valve movable member regardless of the operative state of the valve whereby the introduced cooling medium is continually discharged into the interior of the furnace.

15. Apparatus for selectively hermetically sealing the material storage hopper of a blast furnace charging installation from the furnace throat comprising:

sealing flap means, said flap means including a rotatable valve member;

valve seat defining means, said seat defining means being positioned on the discharge end of the material storage hopper;

means for moving said sealing flap means valve member between an open position and a closed position in contact with said seat defining means;

a source of a pressurized gaseous cooling medium, said cooling medium source being at a pressure in excess of that existing in the blast furnace throat;

first conduit means for delivering coolant from said source to the furnace charging installation; and

cooling medium distribution means, said distribution means being in fluid communication with said first conduit means and continuously discharging cooling medium into the furnace throat and over said sealing flap means valve member whereby the valve member is continuously cooled and the deposit of particulate matter on the sealing surfaces of said valve member is impeded by the coolant flow during the times when the sealing flap means is in an open position.

3,955,694

SIDE LOADING REFUSE BODY

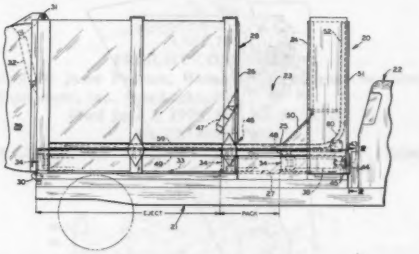
William A. Herpich, Galion, Ohio, assignor to Peabody Galion Corporation, Galion, Ohio

Continuation of Ser. No. 488,428, July 15, 1974, abandoned. This application June 18, 1975, Ser. No. 587,851

The portion of the term of this patent subsequent to Nov. 25, 1992, has been disclaimed.

Int. Cl.² B65F *3/00*

U.S. Cl. 214—82 **10 Claims**



10. A refuse loading and transporting truck having a loading compartment at one end thereof, a larger refuse storage body adjacent such loading compartment, a floor of said loading compartment and a floor of said body lying in substantially the same plane, a partition extending downwardly to a level spaced above said floors and defining an opening from said loading compartment into said body and a ram having a closed rear face and a closed top that is mounted for reciprocatory movement across the bottom of said loading compartment for pushing refuse from said loading compartment through said opening, that is characterized by

a. horizontal guides for said ram extending from forward of said loading compartment to the rear of said storage body for guiding said ram along said floors from a front position with the rear face of said ram closing said opening and to a rear position at the rear of said storage body for ejecting refuse therefrom,

b. hydraulic mechanism for alternatively reciprocating said ram through said storage compartment and into, out of and through said storage body,

c. a multi-part horizontal shield extending the width of said floors and including said top on said ram and having a total length sufficient to extend from the front of said compartment to the rear face of said ram when said ram is in its rear position to assist the ram in the unloading of refuse from said storage body,

d. means coupling said shield parts to said ram for movement with said ram when said ram moves at least rearwardly of said partition, and

e. shield guides extending from forward of said loading compartment to the rear of said storage body for storing said shield parts other than the top of said ram when said ram is at its front position and for guiding said other shield parts as said ram is moved between its position closing said opening in said partition and its rear position.

3,955,695

MACHINE WITH AN OUTRIGGER LATCHING MECHANISM

Herman J. Maurer, Terre Haute, Ind., assignor to J. I. Case Company, Racine, Wis.

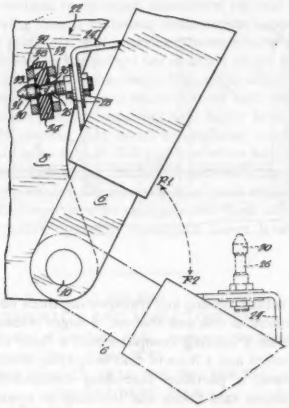
Filed Nov. 18, 1974, Ser. No. 524,352

Int. Cl.² B66S *9/00*; B66C *23/62*; B60S *9/00*

U.S. Cl. 214—140 **2 Claims**

1. In a mobile heavy machine having a frame with a load-lifting boom and at least one outrigger arm pivotally mounted on the frame and movable between a lower ground-engaging position and a substantially vertical raised and inactive posi-

tion, power means for pivoting said outrigger arm, said outrigger arm being adapted to provide lateral stabilization for the machine, the improvement comprising a latching mechanism securing said outrigger arm against said frame when the arm is in said substantially vertical raised and inactive position, said mechanism being operable solely in response to force exerted through said outrigger arm, said mechanism comprising bracket means fixed to said frame, said bracket means including a pair of spaced parallel plates having an opening



therein, a resilient member supported by said plates and having a socket therein aligned with said opening in said plates, and a rigid pin secured to said arm, said rigid pin having an enlarged head portion on an outer end which head portion has a size greater than said socket in said resilient member so that movement of said head portion through said socket in said resilient member will cause said resilient member to expand and subsequently contract after said enlarged portion passes through said socket.

3,955,696

BOTTLE AND SAFETY CLOSURE

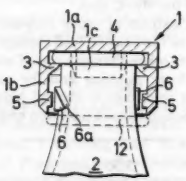
Klaus Werner Finke, Finnentrop-Lenhausen, Germany, assignor to Robert Finke Kunststoff-Spritzguss-Werk, Finnentrop, Germany

Filed Oct. 15, 1974, Ser. No. 514,910

Claims priority, application Germany, Oct. 26, 1973, 2353742

Int. Cl.² B65D *55/02, 85/56;* **A61J** *1/00*

U.S. Cl. 215—214 **11 Claims**



1. In a bottle and safety closure of the kind comprising a bottle having a neck surrounding a mouth, a cap which is made of a material having a low elastic deformability and which has a base and a peripheral wall depending downwardly from said base, said cap located on said neck with said peripheral wall spaced outwardly from said neck, and means for preventing removal of said cap from said bottle unless rendered ineffective by pressing said peripheral wall of said cap inwards at substantially diametrically opposite positions, the improvement wherein said cap is a push-on cap, said cap base has a sealing plug penetrating into said bottle mouth, and said means for preventing removal of said cap from said bottle comprises cooperating retaining means on said bottle neck and said peripheral wall of said cap, said co-operating retaining means including cams located on opposite sides of and projecting outwardly from said bottle neck, said cams spaced angularly apart, at least one upper surface on each of said cams ascending in the circumferential direction of said neck towards said bottle mouth, and cam followers formed on and projecting inwards from opposite positions on the inside of said peripheral wall of said cap, said cam followers spaced angularly apart and located in the range of said cams when said sealing plug penetrates into said bottle mouth, said cam followers located radially outwardly from and clear of said cams when said cap is rotated normally about said bottle neck but when said peripheral wall of said cap is pressed inwards in the regions of said cam followers and said cap is simultaneously rotated in the same direction as said upper surfaces of said cams ascend, said cam followers engage and ride up on said upper surfaces of said cams for releasing said means for preventing removal, and the total circumferential dimension of said cams and of said cam followers being significantly less than the total circumferential dimension of said neck.

3,955,697

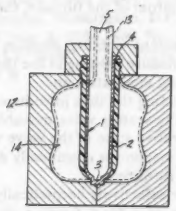
MULTILAYERED HOLLOW PLASTIC CONTAINER

Emery I. Valyi, 5200 Sycamore Ave., Riverdale, N.Y. 10471

Continuation of Ser. No. 309,346, Nov. 24, 1972, abandoned, Continuation-in-part of Ser. Nos. 71,734, Sept. 14, 1970, Pat. No. 3,717,544, and Ser. No. 100,050, Dec. 21, 1971, Pat. No. 3,719,735. This application Jan. 6, 1975, Ser. No. 538,894

Int. Cl.² B65D *23/00, 23/02*

U.S. Cl. 215—1 C **6 Claims**



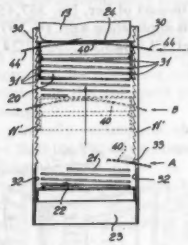
1. A multilayered, blown, seamless hollow plastic container having an open molded neck and having resistance to elevated temperatures and fluid barrier resistance having an outer pressure molded first portion of a plastic material resistant to temperatures in excess of 175° F. and an inner drawn second portion of a plastic material resistant to temperatures in excess of 175° F., wherein said container has a third drawn portion fluid barrier layer of a thermoplastic material between said first and second portions and in substantial conformity therewith, said barrier layer having a lower temperature resistance than said first and second portions, whereby said barrier layer progressively softens and reforms upon exposure to elevated temperature and subsequent cooling to retain its barrier resistant characteristics.

2. A container according to claim **1** wherein said first and second portions are thermoplastic and have resistance to temperatures in excess of 220° F.

3,955,698
NURSING BOTTLE FOR COLLAPSIBLE LIQUID CONTAINERS

Ilse M. Hammer, 46 Place Kieffer, Dollard des Ormeaux, Canada

Filed Jan. 13, 1975, Ser. No. 540,543
Int. Cl.² A61J 9/00
U.S. Cl. 215—11 E 13 Claims



1. A nursing bottle comprising a tubular housing having at least one open end, engageable means for retaining a collapsible liquid container in said housing, an elongated slot formed through a sidewall of said housing and extending longitudinally in a portion of said sidewall, a spring biased movable support member in said housing biased in the direction of said open end for collapsing empty portions of said container against its liquid content, frictional means engageable by said movable support member and displaceably engageable with an inner surface of said tubular housing, said frictional means having a portion thereof extending through said slot.

3,955,699
CLOSE NESTING, TAMPERPROOF CONTAINER CLOSURE

Stephen W. Amberg, St. James, and Rodney E. Ludder, Glen Head, both of N.Y., assignors to Owens-Illinois, Inc., Toledo, Ohio

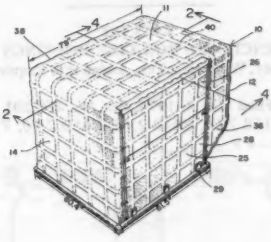
Continuation of Ser. No. 333,972, Feb. 20, 1973, abandoned. This application July 29, 1974, Ser. No. 492,771
Int. Cl.² B65D 41/54
U.S. Cl. 215—246 7 Claims

1. A nestable container closure comprising an imperforate central panel adapted to lie across the open mouth of a container; and an annular skirt attached along its inner periphery to the outer periphery of the central panel and extending outwardly and downwardly from the central panel, the skirt thereby being adapted to surround a finite depth of the wall portion of the container which defines such open mouth, like closures being closely nestable within one another, said annular skirt comprising a convolutely wound elongate strip of expanded heat shrinkable polystyrene, the ends of which are joined to one another in an overlapped seam, said ends being joined to one another at a location that is circumferentially inwardly of the radially outermost of such overlapped ends, thereby providing a manually graspable free end located between the top and bottom edges of the annular skirt and below the central panel by which the closure skirt may be torn from the central panel when it is desired to open a closed container, tearing occurring at the juncture of the skirt and central panel, the central panel being non-heat shrinkable when exposed to the type of heat that will cause the annular skirt to shrink, whereby the closure may be secured to the container, when in place over the mouth thereof, by the application of heat to the annular skirt.

3,955,700
FREIGHT CONTAINER

Rafael De Jesus Pedraza, Hialeah, Fla., assignor to Omni Equipment, Inc., Opa Locka, Fla.

Filed June 2, 1975, Ser. No. 582,616
Int. Cl.² B65J 1/02
U.S. Cl. 220—1.5 7 Claims



1. A container for use in handling airborne freight comprising, in combination,
a top,
a tapered end at one end thereof tapering inwardly at its lower portion,
a flat end opposed to the tapered end,
a door side depending from the top and integral at both ends with the tapered end and the flat end,
a closed side opposed to the door side and depending from the top and integral with the two ends,
a door opening in the door side,
a pallet base having a peripheral rail with an upstanding container,
means for securing the sides, and ends to said rail,
the top, ends and sides being characterized by a plurality of layers of fiberglass and resin, with a horizontal webbing embedded therein, and a vertical webbing embedded therein,
means for securing the container body to the pallet base penetrating each of the vertical webs, thereby encircling the container cargo wth an embedded netting.

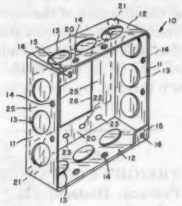
3,955,701
UNIVERSAL EXTENSION FOR OUTLET BOXES

Reinhold Fisch, 29 Elenor Place, Yonkers, N.Y. 10705

Filed Apr. 21, 1975, Ser. No. 569,906
Int. Cl.² H02B 1/10; H02G 3/14
U.S. Cl. 220—3.7 6 Claims

1. An extension ring for extending electrical outlet boxes, comprising a generally rectangular-configured box having first and second opposed side walls and an open front face and a rear face, plural knockout plugs in its side walls, plural inwardly directed tabs having threaded openings located at the box front face at diagonally-located corners for mounting of a cover plate, lips extending inward from first opposed side walls in the plane of the rear face and having plural unthreaded openings, and spaced removable panels extending inward from second opposed side walls in the plane of the rear

face, said box having openings at its corners at its rear face, said lips and panels defining a generally rectangular opening at the center of the rear face, said rear corner openings comprising angularly directed slots at diagonal corners where the panels and lips meet for mounting of the ring on the outlet box.



3,955,702

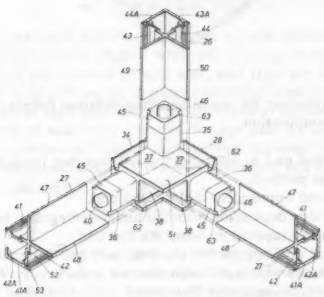
ENCLOSED BOX-LIKE HOUSINGS

Jack W. Lundy, Wimberly, Tex., assignor to Esquire, Inc., New York, N.Y.

Filed May 8, 1974, Ser. No. 468,201

Int. Cl.² F16B 7/00; E04B 2/88; B65D 7/30; F16B 2/20

U.S. Cl. 220—4 F **19 Claims**



1. In an enclosed, box-like housing for a light fixture or the like, which includes a skeleton frame including hollow, elongate side and end frame members, and corner fittings connecting each side frame member with a pair of end frame members, so as to form openings between opposite pairs of side and end frame members, and panels for closing the openings, the improvement comprising each corner fitting including a base having a body, and a pair of legs extending from adjacent sides of the body, a side prong extending perpendicularly from a side of the body adjacent the legs and telescopically received within the open end of a side frame member, and an end prong extending perpendicularly from the end of each leg, and thus perpendicularly to one another as well as the side prong, and telescopically received within the open end of an end frame member, each frame member having flanges which are coextensive of its length and which have end edges flush with the end edges of the frame member and perpendicular to the length thereof, and a flange extending from the legs of the base of each corner fitting and having edges which are flush with the ends of the legs and perpendicular to the length thereof, the end edges of one flange on each end frame member substantially abutting the side edge of a flange of a side frame member, the end edges of the other flange on each end frame member substantially abutting one edge of the flange on said legs, and the end edges of the flanges of each side frame member substantially abutting the sides of the legs of the base from which said flange extends, so as to provide recessed ledges substantially continuously about the openings in the frame on which the panels may be received.

3,955,703

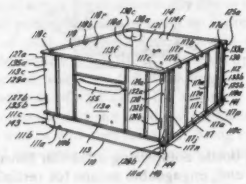
COLLAPSIBLE SHIPPING CONTAINER

Ralph S. Zebarth, 203 Highland Lane, Blue Springs, Mo. 64015

Continuation-in-part of Ser. No. 357,454, May 14, 1973, abandoned. This application Apr. 10, 1975, Ser. No. 558,443

Int. Cl.² B65D 21/02; 7/24, 5/20

U.S. Cl. 220—6 **15 Claims**



1. A collapsible shipping container formed of a semi-rigid thermoplastic material and adapted for stacking in a vertical relationship with a corresponding collapsible shipping container in an erect position and a collapsed position, comprising:

an integrally formed predeterminedly shaped transporting member adapted for folding to and from a collapsed position and an erected position forming a shipping receptacle for receiving cargo, said transporting member comprising:

a generally rectangular base member having a pair of opposing end edges and a pair of opposing side edges;

a pair of opposed fixed upstanding end flanges perpendicularly connected with said base member, each of said upstanding end flanges having a bottom edge located adjacent one of said opposing end edges, a pair of opposing side edges and an upper edge substantially parallel to and located a predetermined distance from the bottom edge;

a pair of opposed end walls pivotally connected with said pair of opposed fixed upstanding end flanges with each of said opposed end walls having a bottom edge located adjacent the upper edge of each upstanding end flange, a pair of opposing side edges and an upper edge substantially parallel to and located a predetermined distance from said bottom edge, said pair of opposed end walls being arranged for movement to and from a collapsed position substantially adjacent and parallel to said base member and an erected position substantially perpendicular to said base member;

a pair of opposed side walls pivotally connected with said base member with each of said opposed side walls having a bottom edge located adjacent one of said opposing side edges, a pair of opposing end edges and an upper edge parallel to and located a predetermined distance from said bottom edge, said pair of opposed side walls being arranged for movement to and from a collapsed position adjacent to said base member and an erected position substantially perpendicular to said base member;

means mounted with each of said side walls and said end walls for releasably interlocking each of said side walls with both of said end walls in an overlapping arrangement when said side walls and end walls are in the erected position to form the shipping receptacle adapted for receiving cargo;

means mounted with said base member for forming a plurality of fixed upstanding reinforced corners substantially perpendicular thereto located at the junctures of said opposing end edges with said opposing side edges of said base member, said reinforced corners adapted to provide reinforcing support and protection to said interlocking means when said side walls and side end walls are interlocked in the erected position; and

an integrally formed predeterminedly shaped lid member adapted for mounting with the opposed edges of said end walls and side walls of the transporting member in the erected position to form an enclosed shipping receptacle for shipping cargo and for receiving and carrying said transporting member in the collapsed position, said lid member comprising:

a lid having a generally rectangular shape and a size slightly greater than the size of said base member of the transporting member; and

a fixed outwardly extending peripheral flange perpendicularly connected with said lid about its periphery, said peripheral flange extending outward a predetermined distance thereto;

said lid member being positioned for mounting with the upper edges of said opposed end walls and side walls in the erected position whereby the peripheral flange is disposed outwardly therefrom to provide said enclosed shipping receptacle; and

said lid member being positionable in an inverted position having said transporting member positioned adjacently therein when said side walls and end walls are in the collapsed position whereby the peripheral flange is disposed outwardly of said base member and said side walls and end walls for carrying the collapsible container in the collapsed position; and

cooperating means respectively mounted with the lid member and the base member of said transporting member for preventing inadvertent relative movement when the shipping container is vertically stacked relative to a corresponding shipping container.

3,955,704

STORAGE DEVICE

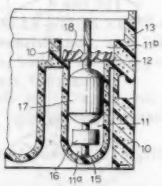
Victor George Smith, Peterlee, and Albert Sjollema, Fence Houses, both of England, assignors to Clearex Plastics Ltd., Haughton-le-Spring, England

Filed July 19, 1973, Ser. No. 380,712

Claims priority, application United Kingdom, July 20, 1972, 33887/72

Int. Cl.² B65D *1/24, 81/06, 85/30*

U.S. Cl. 220—21 **1 Claim**



1. An article storage device comprising a one-piece moulding of a resilient material, said moulding having a plurality of recesses each adapted to receive an article to be stored therein, each of said recesses having an open upper end accessible from one end of the moulding and a closed lower end at the opposite end of said moulding, said upper ends and said lower ends being of generally cylindrical configuration, said upper ends being larger than said lower ends, an annular shoulder formed between the upper and lower ends of each recess, said moulding having a generally cuboidal configuration and shaped so that four sides thereof extend upwardly above the upper ends of said recesses, said one end having a planar surface containing the upper extremities of said upper ends of said recesses, the portions of said moulding forming said lower ends of said recesses being spaced from each other by void areas, said four sides of said moulding extending beyond the lower ends of said recesses, and said four sides being of greater thickness than said portions of said moulding forming said lower ends of said recesses.

3,955,705

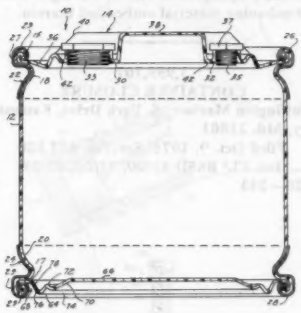
PLASTIC DRUM

Robert A Dubois, Marion, Ohio, and Elmer J. Desher, No. Babylon, N.Y., assignors to Greif Bros. Corporation, Delaware, Ohio

Continuation-in-part of Ser. No. 324,557, Jan. 17, 1973, abandoned. This application July 15, 1974, Ser. No. 488,449

Int. Cl.² B65D *7/42, 21/02*

U.S. Cl. 220—67 **8 Claims**



1. An essentially all plastic drum comprising:

an elongated tubular plastic body member;

a plastic bottom closure secured to one end portion of said body member;

a plastic top closure secured to the other end portion of said body member;

at least one opening in one of said closures;

said top closure including a radially outwardly extending peripheral ledge overlying the top edge of said body member;

a top chime being rolled inwardly about the top end portion of said body member and said top closure, said top chime when unrolled including a main body portion and a radially inwardly and downwardly extending top portion overlying and contacting the outer surfaces of said top closure ledge and said top end portion of said body member and clamping said top closure ledge and said top end portion of said body member together;

said top chime being spirally wound inwardly about said top closure and said top end portion of said body member through at least 360° of arc and being completely out of contact with the interior of said drum; and,

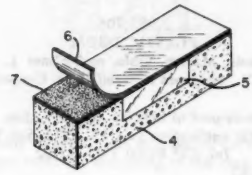
a bottom chime substantially identical in construction to said top chime securing said bottom closure to said body member.

3,955,706

AIR REFRESHENER AND DEODORIZED WASTE CONTAINER

William King Whitaker, 3601 N. Harrison St., Arlington, Va. 22207

Filed Mar. 19, 1975, Ser. No. 559,777
Int. Cl.² B65D 25/00; A61L 9/04
U.S. Cl. 220—87 10 Claims



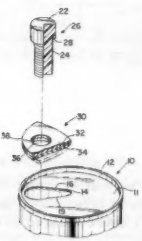
1. A container for waste products having an air refreshener on interior wall(s) of said container, wherein the air refreshener comprises a sponge-like carrier having a solid vaporizable air refreshening material embedded therein.

3,955,707

CONTAINER CLOSURE

William Huffington Mariner, S. Park Drive, Extension Rte. 4, Salisbury, Md. 21801

Filed Oct. 9, 1975, Ser. No. 621,120
Int. Cl.² B65D 45/00, 53/00, 45/28
U.S. Cl. 220—243 13 Claims



1. In combination, a container having an opening in a surface thereof, which opening has a pair of opposed edges, and a closure device therefor, said closure device comprising:

a cap member having an upper part and a threaded lower part,

a sealing member of an overall size and shape sufficiently large to over the opening,

said cap member passing through a central portion of the sealing member such that the lower threaded part thereof is located below the sealing member,

the threads of the threaded cap member being of a size such that they threadedly engage the said opposed edges of the opening,

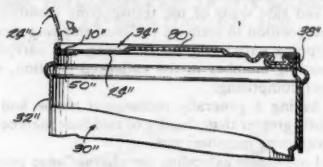
said upper part of the cap member comprising means for cooperating with the sealing member to urge the same into tight sealing engagement with the top of the can to cover the opening as the said lower threaded part is threadedly tightened into the opening.

3,955,708

EASY-OPENING PULL TAB TYPE CAN WITH RETAINED TAB

Murlin L. Hulse, Rte. No. 1 M-62, Cassopolis, Mich. 49031

Division of Ser. No. 241,653, April 6, 1972, Pat. No. 3,820,681. This application June 17, 1974, Ser. No. 479,838
Claims priority, application Italy, Apr. 5, 1973, 49263/73
Int. Cl.² B65D 41/32
U.S. Cl. 220—269 4 Claims



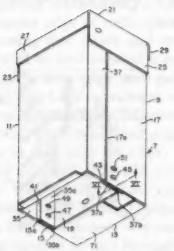
1. A container construction for vacuum packed products, having a pull tab opening device and comprising: a body section and an end portion closing one end of said body section, said end portion including a panel section to which said pull tab device is attached, said panel section being defined by a score-line which includes a weakened, frangible base wall section, said end portion including a debossed area with said score-line terminating at spaced points on the periphery of said debossed area, such that during opening, fracture of said frangible base wall section will terminate at said debossed area, with said debossed area providing a fulcrum point for bending of the panel section upon the continued application of opening forces, thereby inhibiting complete removal of said panel section from said end portion, and an indicator device on said end portion which is in a first condition when the vacuum has been maintained in the container and in a second condition when the vacuum has been broken.

3,955,709

OUTDOOR ELECTRICAL ENCLOSURE

Kenneth R. Coley, Fairfield, and George M. Carris, Monore, both of Conn., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 18, 1974, Ser. No. 507,164
Int. Cl.² B65D 43/24
U.S. Cl. 220—335 5 Claims



1. An outdoor enclosure for containing electrical apparatus, comprising a box-like container and a detachable cover hingedly mounted; the container comprising a bottom wall, an upper end wall, and a pair of opposite sidewalls forming an open side for access to the interior of the container; the cover comprising a front wall coextensive with the open side and having opposite side flanges, each side flange including an inturned shoulder dividing each flange into two longitudinal portions, one longitudinal portion being adjacent to the cover

front wall and the second longitudinal portion being remote from said front wall, the shoulders abutting the edges of the corresponding side walls, a partition extending across the interior of the container, the inner edges of the second longitudinal portions contacting the partition when the cover is closed; means for hingedly mounting the cover on the container for movement between open and closed positions and comprising interfitting members including a groove and a protrusion on the opposite side walls, one of the groove and protrusion being on the cover and the other of the groove and protrusion being on opposite sides of the container, and the protrusions being slidable in the grooves between open and closed positions of the cover for latching the cover in the open position and comprising a projection on at least one of the side walls and abuttable with the cover when the cover is open and the protrusions are in the open positions in the grooves.

3,955,710

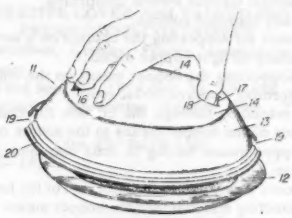
COVERED CONTAINER FOR SERVING FOOD WITH COMBINATION VENTILATION AND FINGER HOLES

Nicholas D. Commisso, Victor, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed June 3, 1974, Ser. No. 475,735

Int. Cl.² B65D *51/16*

U.S. Cl. 220—367 **2 Claims**



1. A plastic container cover for use in serving food comprising a generally planar, circular top wall, an outwardly flaring, downwardly depending annular side wall having an arcuate rim integrally joined around its lower periphery, said top wall being characterized by having a plurality of apertures therein, each of said apertures having an associated closure member formed from a portion of said top wall, said arcuate rim being adapted to lockingly engage the periphery of a dish member, said arcuate rim being further characterized as discontinuous and radially expandable, having at least one notch therein.

3,955,711

DISPENSER FOR SELF-STICK STRIP-CARRIED LABELS

Carl Schroter, Rommelshausen, and Friedrich Kirchdorfer, Stuttgart-Wangen, both of Germany, assignors to Heinrich Hermann, Stuttgart, Germany

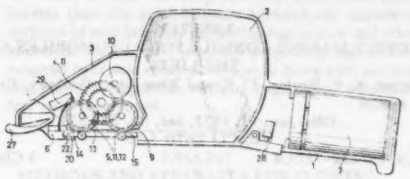
Filed July 25, 1974, Ser. No. 491,630

Claims priority, application Germany, July 26, 1973, 2337946

Int. Cl.² B65C *9/18*; **B65H** *5/28*

U.S. Cl. 221—73 **17 Claims**

1. A dispenser for self-stick labels removably stuck on one side of a flexible carrier strip in a row extending longitudinally along the strip, said dispenser having a forwarding device for forwardly moving the strip while carrying the labels, and a strip deflector means for deflecting and bending the forwardly moving strip sharply enough away from the labels to thereby peel the strip from the labels for dispensing the labels; wherein the improvement comprises said device being positioned ahead of said deflector with respect to the forwardly moving strip and comprising means for pushing the strip with the labels stuck thereon forwardly to said deflector means, and the deflector means being a deflector forming a surface of concave contour tangentially with respect to the strip and extending transversely with respect to and facing in a direction opposite to the forwardly moving strip and labels and being



positioned behind said forwarding device with respect to the forwardly moving strip and for engagement by said side of the strip.

3,955,712

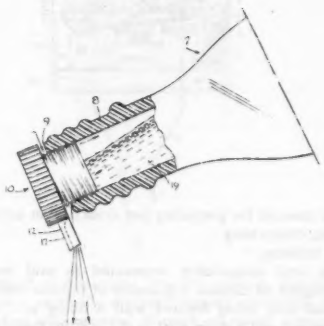
BOTTLE STOPPER

Anthony Santore, 249 Calhoun Ave., Bronx, N.Y. 10465

Filed Sept. 12, 1974, Ser. No. 505,478

Int. Cl.² B65D *47/06*

U.S. Cl. 222—80 **10 Claims**



1. A hollow stopper for dispensing liquid from a bottle having a neck and top lip, comprising:

a top wall having a laterally extending, downwardly open, spout-like protrusion, said wall having a continuous annular undersurface for sealing engagement with the top lip of a bottle; and

an annular skirt depending from the top wall inwardly of said undersurface, said skirt being adapted to fit within the neck of a bottle and to move axially with respect thereto between a sealing position in which said undersurface is in sealing engagement with the top of the bottle and a plurality of dispensing positions in which said undersurface is spaced from the top lip of the bottle, said skirt defining a hollow, central cavity opening toward the interior of the bottle and said skirt having an elongated substantially axial pouring slot extending through said skirt from the top wall undersurface along one side of the skirt and in alignment with the spout-like protrusion and a continuous, substantially axially extending, air-admitting groove along the outer, opposite side surface of the skirt spaced from the pouring slot and extending from the top wall undersurface towards the free end of the skirt but not extending through the skirt, so that when the stopper is positioned on the neck of a bottle with said undersurface spaced from the lip of the bottle, liquid from the interior of the bottle can flow into said cavity and thence through said slot, over said undersurface and along said

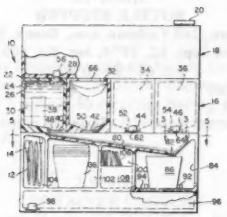
spout-like protrusion for dispensing such liquid at a desired rate.

3,955,713

COFFEE MAKING CONSOLE FOR AUTOMOBILES AND THE LIKE

Joseph A. P. Hurley, 17 Grand View Ave., Danbury, Conn. 06810

Filed Jan. 13, 1975, Ser. No. 540,511
Int. Cl.[2] B67D 5/56
U.S. Cl. 222—129.4 3 Claims



1. A console for preparing hot drinks in an automobile or the like, comprising

a. a housing,

b. a tank detatchably connected to said housing and adapted to contain a quantity of potable water therein, said tank being formed with a filling port at the top thereof and a drain port at the bottom thereof,

c. said housing being formed with a plurality of horizontally adjacent compartments each adapted to store a different drink ingredient and each compartment formed with a drain port at the bottom thereof and a filling port at the top thereof normally closed by said tank,

d. heating means disposed in one of said compartment for heating water stored therein,

e. a spring-loaded manually operated slide valve connected to said tank at the tank drain port and at the filling port of said one compartment for transferring water from said tank to said one compartment,

f. an elongated funneled trough mounted to said housing below all of said compartments,

g. a cup filling station disposed below said trough at the funnel opening thereof and adapted to receive a cup therein, and,

h. a spring-loaded manually operated slide valve connected to each of said compartments at each respective compartment drain port in position to dispense water and other ingredients onto said trough,

i. said tank being detachably connected to and coextensive with the top of said housing,

j. an electrical cord connected to said heating means at one end and detachably connected at the other end to the electrical system of said automobile,

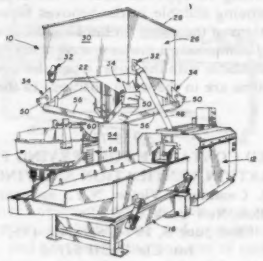
k. each of said slide valves associated with said other compartments including metering means for dispensing a measured amount of ingredient from its associated compartment onto said trough.

3,955,714

VACUUM OPERATED MATERIAL TRANSFER SYSTEM

Jerry Walter Boyes; Raymon Kelsick Elkins, both of Arlington; Richard Neil Hutson, Dallas, and William Carroll Reed, Arlington, all of Tex., assignors to The Hutson Corporation, Arlington, Tex.

Filed June 12, 1975, Ser. No. 586,247
Int. Cl.[2] B67D 5/60
U.S. Cl. 222—132 10 Claims



1. A material transfer system comprising:

a vertically disposed column;

base means for supporting the column on a surface;

substantially airtight hopper means;

means supporting the hopper means on the column;

means forming a source of vacuum;

means extending through the column for connecting the interior of the hopper means to the source of vacuum;

said hopper means having at least one inlet port formed therein;

hose means connected to the inlet port of the hopper means for directing material into the hopper means through the inlet ports thereof;

said hopper means having at least one discharge port formed in the bottom thereof; and

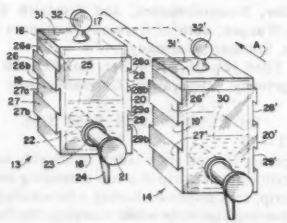
means responsive to the presence of vacuum in the hopper means for sealing the discharge port of the hopper means.

3,955,715

BATH AND SHOWER MODULAR DISPENSER ARRANGEMENT

Alan C. Topor, 2100 Jamestown Way, Oxnard, Calif. 93030

Filed Mar. 13, 1975, Ser. No. 558,172
Int. Cl.[2] B65D 21/02
U.S. Cl. 222—143 3 Claims



1. A bath and shower modular dispenser arrangement comprising, in combination:

a. a container having a closed bottom and front, rear, left and right side walls;

b. a manually operable liquid dispenser extending from the interior of the container for dispensing liquid when said container is filled with liquid;

c. holding means on said rear wall for securing said rear wall against a vertical surface adjacent to a bath or shower when pressed thereagainst;

d. interengaging means comprising first and second portions on the left and right side walls respectively, such that the first portion on the left wall of an identical additional container may be interfitted with the second portion on the right wall of said first-mentioned container by positioning the rear of the left wall of the additional container adjacent to the front of the right wall of the first-mentioned container and sliding the additional container in a rearward horizontal direction so that the additional container is secured in side-by-side relationship with the first-mentioned container, the upper outside wall portion of the front, rear, left and right side walls being of less thickness than the remaining portions to define an annular ledge about the top of the container; and,

e. a cover for the container dimensioned to fit over said ledge so that its front, rear and left sides are flush with the remaining portion of the front, rear and left side walls of the container, the right side wall of the container being thicker than the remaining walls so that a space is left between the covers on the adjacent containers resulting from the interlocking of said additional container to said first-mentioned container.

3,955,716

DECORATIVE COVER FOR VALVED END OF PRESSURIZED CONTAINERS

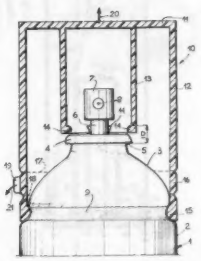
Antonin Goncalves, Groslay, France, assignor to L'Oreal, Paris, France

Filed Sept. 23, 1974, Ser. No. 508,696

Claims priority, application France, Nov. 27, 1973, 73.42137

Int. Cl.² B67B *5/00*

U.S. Cl. 222—153 **3 Claims**



1. In a device comprising a substantially cylindrical container and a substantially cylindrical cover adapted to be mounted on one end of said container with their axes coincident,

said cover having a transverse top closing one end of said cover, and a cylindrical outer wall encircling a shorter cylindrical inner wall radially spaced from said outer wall, each of said cylindrical walls having a first end joined to the same side of said top and a second free end remote from said top, the free end of said outer wall terminating in a retaining ring having a portion which projects radially inward from said outer wall, and said outer wall being formed with a tear strip between said top and retaining ring,

said container having two peripheral axially spaced abutments, each having a diameter approximating that of one of said cylindrical cover walls, with one of said abutments positioned and dimensioned to permanently engage said retaining ring,

the improvement according to which the free end of said inner cylindrical wall is provided with a plurality of inwardly projecting lugs, each having at least one transverse surface axially spaced from a transverse surface on the other of said abutments, when said tear strip is intact and said retaining ring in engagement with said one abutment, the width of said tear strip axially of said cover being greater than the axial distance between the transverse surfaces of said inwardly projecting lugs and of said other abutment so that said inwardly projecting lugs can be snapped over said other abutment to bring said surfaces into manually separable latching engagement when said tear strip is removed.

3,955,717

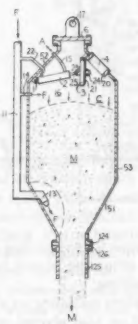
METHODS AND APPARATUS FOR FLOWING ARCHABLE MATERIALS

Richard E. Landau, 717 Cornwell Ave., West Hempstead, N.Y. 11552

Continuation-in-part of Ser. No. 848,113, Aug. 6, 1969, which is a continuation-in-part of Ser. No. 616,753, Feb. 13, 1967. This application Aug. 16, 1971, Ser. No. 171,944

Int. Cl.² B65G *3/12*

U.S. Cl. 222—195 **4 Claims**



1. A method of dispensing flowable granular material by gravity from a vertically oriented hopper selectively closed and dispensing said material through an outlet comprising: supplying the hopper with granular material through a selectively closed passage in the hopper; injecting compressible fluid under pressure into the material at a point in the area of the tapered outlet; injecting said fluid under pressure in a direction in the area of the tapered outlet so that the entry of said fluid into the hopper does not exert pressure to obstruct gravity flow of said material; dispersing said compressible fluid as said fluid expands throughout the granular material so that a free fluid state is induced in the granular material to aid dispensing; providing sufficient fluid during dispensing operation to cause a pocket of fluid to form about said fluid inlet to promote dispersion of said fluid throughout said granular material, and providing a slight overpressure on top of the material by reason of said fluid escaping through the top of said granular material within said hopper.

3,955,718

CONTAINER VIBRATOR MECHANISM FOR USE IN A VENDING MACHINE

John W. Von Holdt, Niles, and George C. Stelyn, Crystal Lake, both of Ill., assignors to United Ventures, Inc., Granite Falls, Minn.

Filed May 19, 1975, Ser. No. 578,511

Int. Cl.² B65G *65/70*

U.S. Cl. 222—197 **7 Claims**

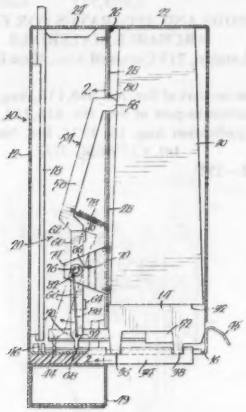
1. In a vending machine for dispensing a powdered material from a container disposed therein, the combination comprising:

a housing adapted to have a container for powdered material supported therein;

a dispensing receptacle disposed in the lower portion of said housing and adapted to have the open end of a container seated thereon;

a slide mechanism disposed in said housing beneath the container which stores the powdered material to be dispensed, said slide mechanism being effective to actuate means for dispensing material from the container;

a vibrator mechanism for vibrating the container and its contents said vibrater mechanism being pivotally mounted within said housing;



pivotal mounting means for supporting said vibrator mechanism said pivotal mounting means being connected to a portion of said housing;

said vibrator mechanism including an elongated striker arm pivotally mounted on said pivotal mounting means, said striker arm being adapted to strike the container under the influence of spring biasing means when released from a cocked position;

interengaging means on said slide mechanism and said vibrator mechanism for cocking said vibrator mechanism with each forward movement. of said slide mechanism;

said slide mechanism being effective when moved to its forward position to automatically release the striker arm to strike the container.

3,955,719

CONICALLY WALLED SYRINGE PROVIDING A PROGRESSIVELY TIGHTER PISTON FIT

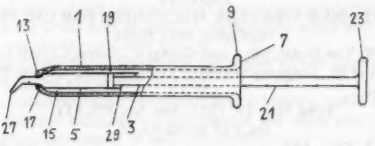
Jean Pheulpin, Avenue du Theatre 7, CH 1000 Lausanne, Switzerland

Filed Jan. 25, 1974, Ser. No. 436,668

Claims priority, application Switzerland, Jan. 30, 1973, 1262/73

Int. Cl.² G01F *11/00*

U.S. Cl. 222—386 **7 Claims**



1. A syringe for injecting a material into a cavity or the like, said syringe comprising:

a cylindrical tube having first and second ends,

said first end being open and said second end being constricted;

a generally tubularly walled reservoir for receiving the material to be injected, said reservoir having a first end with a nozzle thereon and an open second end,

said reservoir being of such size as to be inserted nozzle end first into the open of said cylindrical tube and moved through said tube to said constricted end whereby said nozzle protrudes through said constricted end; and,

a piston axially movable in the cylindrical tube and capable of being received into the open end of said reservoir, said piston forming a sliding seal with the wall of said reservoir whereby material in said reservoir is pushed toward said nozzle end as the piston is moved into said reservoir;

the wall of said reservoir being conically shaped and made of a slightly stretchable material to provide an increasingly tighter sliding seal with said piston as the piston is moved toward said nozzle end.

3,955,720

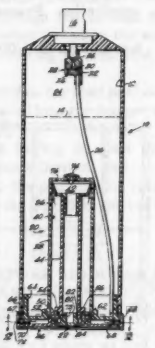
LOW PRESSURE DISPENSING APPARATUS WITH AIR PUMP

David C. Malone, 2281 SW. 33rd Way, Fort Lauderdale, Fla. 33312

Continuation-in-part of Ser. No. 306,517, Nov. 15, 1972, abandoned. This application Oct. 25, 1973, Ser. No. 409,739

Int. Cl.² B65D *83/14*

U.S. Cl. 222—396 **35 Claims**



10. Dispensing apparatus for dispensing an aerosol spray, jet, or the like; comprising: container means; a pumping mechanism forming a part of said container means and comprising a pumping chamber and a pumping means within said pumping chamber for taking atmospheric air into said pumping chamber and forcing it into said container means; and valve means for venting said pumping chamber, said valve means being manually operable to vent said pumping chamber to atmosphere without actuating said pumping mechanism to thereby render said pumping means incapable of forcing air into said container means.

3,955,721

EXPENDABLE TUNDISH LINER

Micheal Donald La Bate, 115 Hazen Ave., Ellwood City, Pa. 16117

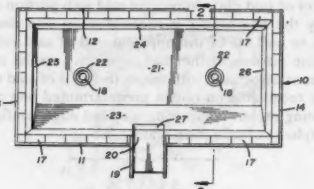
Filed Sept. 12, 1974, Ser. No. 505,494

Int. Cl.² B22D *41/02*

U.S. Cl. 222—566 **8 Claims**

1. A lined tundish for intermediate pouring of molten metal including an open topped apertured metallic vessel, a nozzle

in said aperture, in which the liner comprises a protective expendible material covering the inner walls of said vessel and apertured for registry with said nozzle, said liner formed of a



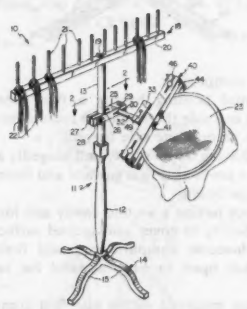
plurality of shaped inserts of combustible material having a known rate of consumability which is sufficiently long to complete a pour of molten metal.

3,955,722

NEEDLEWORK FRAME SUPPORT STAND

Donald I. Bard, 7901 College Lane, Annandale, Va. 22003

Filed July 16, 1975, Ser. No. 596,534
Int. Cl.² A41H *31/00*
U.S. Cl. 223—106 **5 Claims**



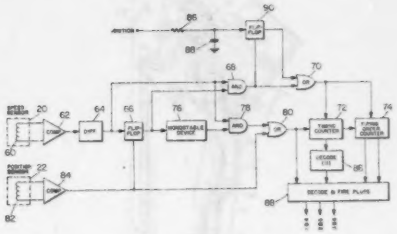
1. Apparatus for supporting a fancy needlework frame in a position convenient to a craftsman comprising a baluster column having a vaselike curved lower portion and a generally cylindrical upper portion, a base member fixed to one end of said lower portion, a thread supply supporting structure carried by said upper portion, said thread supply supporting structure including a plurality of upstanding pin means around which different colored threads are draped, an adjusting block slidably and rotatably mounted on the upper portion of said column, means for securing said adjusting block in fixed adjusted position on said column, dowel rod means slidably and rotatably mounted within said adjusting block, means for fixing said dowel rod means in adjusted position relative to said adjusting block, an anchor block carried by said dowel rod means, a hinge having a first portion mounted on said anchor block and a second portion movable relative thereto, and means for connecting the second portion of said hinge to a fancy needlework frame, whereby said adjusting block may be fixed in a selected position on the upper portion of said column and said anchor block is slidably and rotatably adjusted relative to said adjusting block to locate the working frame in a position convenient to a craftsman.

3,955,723

ELECTRONIC IGNITION SPARK ADVANCE SYSTEM

David W. Richards, San Diego, Calif., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 452,933, March 20, 1974, abandoned. This application Nov. 29, 1974, Ser. No. 528,427
Int. Cl.² F02P *5/04*
U.S. Cl. 123—117 R **9 Claims**



1. In an internal combustion-engine including an output shaft, spark plugs and an ignition-spark advances for controlling the firing of the spark plugs in which the desired spark advance curve is a non-linear function of engine speed, the improvement comprising, in combination:

pulse generating means responsive to rotation of the output shaft of the engine for generating a first train of pulses including a first reference pulse and a plurality of additional pulses in which the pulses have a first predetermined relative spacing and a second train of pulses indicative of the angular position of the shaft of the engine relative to a predetermined angular position in which the pulses have a second predetermined relative spacing, in which at least one of the first predetermined relative spacing of the pulses in the first train of pulses and the second predetermined relative spacing of the pulses in the second train of pulses is a non-linear relative spacing;

timing means for measuring the passage of a predetermined fixed time period after the occurrence of the first reference pulse in the first train of pulses;

the first predetermined relative spacing of the pulses in the first train of pulses and the second predetermined relative spacing of the pulses in the second train of pulses being a function of the fixed time period measured by the timing means and of each other such that, for any given engine speed, at substantially the angular position of the shaft of the engine at which firing of the spark plugs is indicated by the spark advance curve for that given engine speed, the sum of the number of pulses in the first train of pulses which occurred during the fixed time period measured by the timing means plus the number of pulses which have occurred in the second train of pulses is equal to a fixed number;

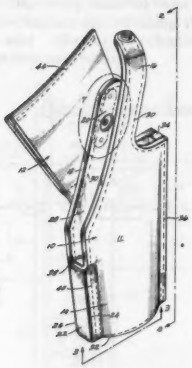
a counter;

gate means responsive to the timing means for applying to the counter those pulses in the first train of pulses which occur during the predetermined fixed period;

means for applying the second train of pulses to the counter; and

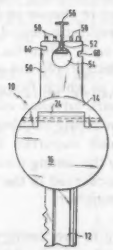
means responsive to the count in the counter reaching a predetermined count equal to the fixed number for firing the spark plugs in the engine.

3,955,724
HOLSTER
Neale A. Perkins, Sierra Madre, Calif., assignor to Safariland Ltd. Inc., Monrovia, Calif.
Filed Dec. 5, 1974, Ser. No. 529,898
Int. Cl.² F41B 13/04
U.S. Cl. 224—2 B 12 Claims



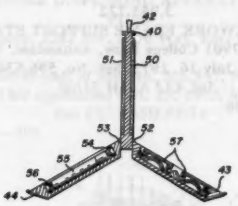
1. In a holster for carrying a firearm and having a leather shank portion of a belt loop attached by stitching to a leather inner pannel of the holster, an improved means for attaching the belt loop to the holster comprising a thread-holding sheet covering an area between overlying portions of the side panel of the holster and the leather shank of the belt loop; and one or more rows of threads stitched through the belt loop shank, the thread-holding sheet, and the inner panel of the holster to fasten the belt loop to the holster, the thread-holding sheet being made from a material which provides greater resistance to tearing of the threads than when the leather belt loop shank is stitched directly to the leather panel of the holster.

3,955,725
KEY HOLDER
Arkadijus Rese, Gossau, Switzerland, assignor to Eberhardt & Co., Germany
Filed Aug. 30, 1974, Ser. No. 502,182
Claims priority, application Germany, Dec. 8, 1973, 2361321
Int. Cl.² A45F 5/02
U.S. Cl. 224—5 R 11 Claims



1. In combination with an automatic key dispensing machine having a plurality of slide rails each of which receives keys at one end and dispenses them from the other end, each said rail having longitudinally extending web and flange portions; a key holder comprising means for securing a key to the key holder, separate means for attaching the key holder to the clothing or person of a customer and a slide plate portion by means of which the key is dispensable by and returnable to said automatic key dispensing machine, said slide plate portion having a through opening to receive said flange portion of one of said rails and a slit connecting said opening with the periphery of said plate to receive said web portion of said rail, whereby the key holder is receivable on said slide rail and slidable to and off of the opposite end of said rail, and said slide plate portion further having coding means cooperating with means associated with respective rails of said machine so as to be receivable on only a predetermined one of said rails said coding means comprising a coded edge configuration of the periphery of said slide plate.

3,955,726
CONTACT LENS LOCKET
Helen Reitzel, 660 Mariposa Ave., Mountain View, Calif. 94040
Filed July 3, 1974, Ser. No. 485,497
Int. Cl.² A45C 11/04
U.S. Cl. 224—5 R 5 Claims

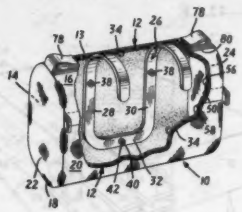


1. A locket comprising:
an ornamental housing having a first recessed surface formed in one side thereof and a second recessed surface formed in an opposite side thereof;
a first door having a first cavity and hingedly affixed to said housing to cover said first surface and form a first closeable compartment;
a second door having a second cavity and hingedly affixed to said housing to cover said second surface and form a second closeable compartment, said first and second doors when open forming a stand for supporting the locket;
a sub-housing mounted within said first compartment and forming a third cavity for storing contact lenses, the material of said sub-housing being inert so as not to interact with the liquid preparation generally used to store contact lenses; and
a cover means of the same material as said sub-housing and adapted to mate with said sub-housing to form a watertight container for the contact lenses.

3,955,727
CARRIER BAGS FOR BICYCLES
Joseph S. Montgomery, Stamford, Conn., assignor to Cannondale Corporation, Stamford, Conn.
Filed Jan. 31, 1975, Ser. No. 546,141
Int. Cl.² B62J 7/04; A45C 13/04
U.S. Cl. 224—31 12 Claims

1. A carrier bag for attachment to bicycles or the like comprising an outer enclosure of semi-flexible material having a top wall, a bottom wall, left and right end walls, and front and back walls defining an enclosed volume a substantially rigid, three-dimensional frame member received within and joined to the outer enclosure and shape to match and positioned in engagement with at least two adjacent walls of the enclosure, one of said walls being the back wall, the frame member including strips of rigid material defining a pair of spaced

apart generally j-shaped legs, the straight portions of which engage the back wall of the enclosure and the curved portions of which engage at least one of the top and bottom walls of the enclosure, and a pair of hooks on the outside of the back wall



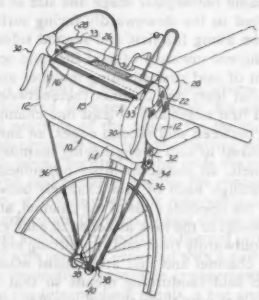
of the enclosure, one hook being connected to the straight portion of each leg of the frame member and the hooks being adapted to be attached to a bicycle, whereby a load in the enclosure is transmitted from the enclosure to the frame, from the frame to the hooks and from the hooks to the bicycle.

3,955,728

HANDLEBAR BAG

W. Shaun Jackson, 809 Sycamore, Ann Arbor, Mich. 48104, and Leslie Eric Bohm, 29560 Rutherland North, Southfield, Mich. 48076

Filed May 28, 1974, Ser. No. 473,342
Int. Cl.² B62J *7/00*
U.S. Cl. 224—31 **10 Claims**



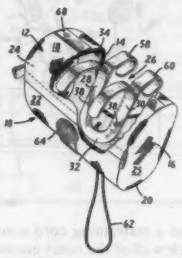
1. An article carrier adapted to be supported on the handlebars of a cycle and stabilized by the front axle of the cycle, comprising: an enclosed bag having an access opening; closure means associated with the opening; a pair of elongated flexible straps each having one end affixed to the bag at one of a pair of spaced points and adapted to be secured to the opposed handlebars so that the line on the bag between the points of attachment of the straps is suspended substantially horizontally; a pair of elongated flexible members each having one end fixed to the bag at one of a pair of connecting means on the bottom surface of the bag, the connecting means being spaced from one another and from the points of attachment of the straps to the bag; and connector means attached to the free end of each flexible member to secure the elastic member adjacent to the front axle area of the cycle so as to suspend the bag between and below the handlebars.

3,955,729

CARRIER BAG FOR ATTACHMENT TO UPRIGHT HANDLEBARS OF BICYCLE

Joseph S. Montgomery, Stamford, Conn., assignor to Cannondale Corporation, Stamford, Conn.

Filed Jan. 31, 1975, Ser. No. 546,017
The portion of the term of this patent subsequent to May 11, 1993, has been disclaimed.
Int. Cl.² B62J *7/06*; **A45C** *13/04*
U.S. Cl. 224—36 **5 Claims**



1. A carrier bag for attachment to upright handlebars of a bicycle or the like comprising an outer enclosure of semi-flexible material having a top wall, a bottom wall, left and right end walls and front and back walls defining an enclosed volume;

a substantially rigid, three-dimensional frame member received within the outer enclosure, the frame member including a pair of spaced-apart legs of generally inverted J-shape positioned in engagement with the back wall and the top wall of the enclosure;

a pair of spaced-apart mounting hooks of generally inverted J-shape, each of which is connected to a respective leg of the frame and projects exteriorally away from the back of the back wall of the bag in position for engagement of a hook portion thereof with the handlebars wherein the spaced-apart hooks are adapted to engage the handlebars on either side of the handle bar stem by which the handlebars are connected to the bicycle and wherein the mounting hooks are connected near the lower end of the frame thereby positioning the top wall of the enclosure above the handlebars and the bottom wall above and out of engagement with the front wheel of the bicycle; and a restraining cord connected to the lower portion of the back wall of the enclosure and adapted to be hooked around the handlebar stem to inhibit sway of the bag.

3,955,730

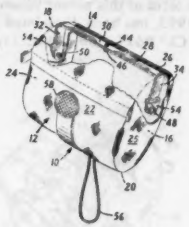
CARRIER BAG FOR ATTACHMENT TO DROP HANDLEBARS OF A BICYCLE

Joseph S. Montgomery, Stamford, Conn., assignor to Cannondale Corporation, Stamford, Conn.

Filed Jan. 31, 1975, Ser. No. 546,140
Int. Cl.² B62J *7/06*; **A45C** *13/04*
U.S. Cl. 224—36 **3 Claims**

1. A carrier bag for mounting on the brake lever housings located on the drop handlebars of a bicycle or the like comprising an outer enclosure of semi-flexible material having a top wall, a bottom wall, left and right end walls and front and back walls defining an enclosed volume, the distance between the end walls being less than the distance between the drop portions of the handlebars, a substantially rigid frame member of inverted U-shape received within the outer enclosure, the frame member including a base portion extending generally medially along and in engagement with the top wall and depending leg portions extending downward from the base portion along at least the upper portions of respective end walls, means connected to each leg of the frame and adapted to be connected to a respective brake lever housing, wherein the

connecting means is connected to each leg of the frame substantially below the top wall of the enclosure thereby positioning the top wall of the enclosure above the handlebars and the bottom wall above and out of engagement with the front wheel



of the bicycle, and a restraining cord connected to the lower portion of the back wall of the outer enclosure and adapted to be hooked over a neck portion of the handlebars to prevent sway.

3,955,731

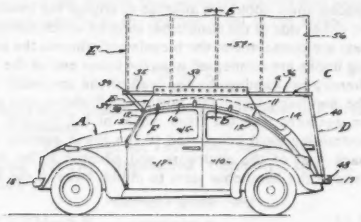
CONVERTIBLE TOP CARRIER-LIVING COMPARTMENT STORAGE UNIT FOR PASSENGER VEHICLES

Wesley H. Lindelef, and Helen M. Lindelef, both of P.O. Box 964 25215 Oak St., Apt. 5, Lomita, Calif. 90717

Filed July 29, 1971, Ser. No. 167,354

Int. Cl.[2] B60R 9/04; E04B 1/347

U.S. Cl. 224—42.1 E **2 Claims**



1. A top carrier for passenger vehicles and adapted to be supportably fitted to the vehicle roof and expansible over both the front and rear ends of the vehicle, and comprising, a body with a top deck in a plane spaced above the vehicle roof and with a bottom complementary to and supportably engageable upon said roof, anchor means securing the body to the vehicle roof, a flat front cover hinged to the front edge of the top deck to swing from a condition overlying a front portion of said top deck to a condition extending to overlie the front end of the vehicle, there being means supporting the front cover in said extended condition coplanar with said top deck, a flat rear cover hinged to the rear edge of the top deck to swing from a condition overlying a rear portion of said top deck to a condition extending to overlie the rear end of the vehicle, there being a multi-purpose cover securement and support means firstly securing each of the front and rear covers in said top deck overlying condition and secondly supporting the rear cover in said extended condition coplanar with said top deck.

3,955,732

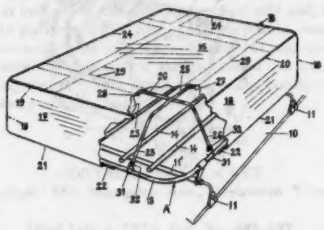
LUGGAGE COVER AND RETAINING MEANS

Astrid Irma Böschen, Domarevagen 31, 433 00 Partille, Sweden

Filed Mar. 25, 1974, Ser. No. 454,783

Int. Cl.[2] B60R 9/04

U.S. Cl. 224—42.1 E **1 Claim**



1. A luggage cover and retainer for an automobile having a substantially quadrilateral roof rack with a surrounding rail, comprising a tarpaulin having a rectangular roof portion of substantially the same lateral dimensions as that of the rack, said roof portion laterally defined by a pair of oppositely spaced first edges and a pair of oppositely spaced second edges extending transversely between said first edges, said roof portion having a downwardly facing surface arranged to be directed toward the rack and an upwardly facing surface, a marginal portion extending completely around the periphery of the roof portion and connected to the first and second edges of said roof portion and arranged to extend downwardly from the first and second edges to form a hood-shaped unit adapted to enclose the rail of the rack and any luggage thereon, a pliable internal strengthening member of substantially the same rectangular shape and size as said roof portion and attached to the downwardly facing surface side of said roof portion along the first and second sides thereof and to portions thereof inwardly of said first and second edges, the attachment of said strengthening member and said roof portion forms at least one channel therebetween extending between said first edges and at least one channel therebetween extending between said second edges, an annular reinforcing means secured to said strengthening member at each end of said channels, an elastic member positioned within and extending through each of said channels between said means located at the opposite ends of the channel, attachment means for securement to the rack attached to each end of said elastic members outwardly from said reinforcing means at the end of each said channel and said attachment means being shaped relative to said reinforcing means so that said attachment means can not pass through said annular reinforcing means, said marginal portion having a pair of spaced edges extending completely around said roof portion with one said edge connected to said roof portion and the other said edge spaced from said roof portion being hemmed to form a peripheral passage extending for the entire length of said marginal portion around said roof portion, and means in said peripheral passage and extending therethrough for the entire length of said peripheral passage for pulling said marginal portion tight around the rack and any luggage thereon.

3,955,733

RECORD HOLDER CARRYING CASE

William A. Russell, 1214 Beverly, Springfield, Ohio 45504

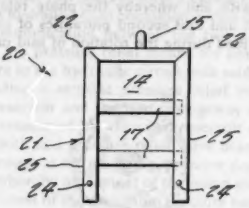
Filed June 13, 1974, Ser. No. 478,942

Int. Cl.[2] B65D 71/00

U.S. Cl. 224—45 K **1 Claim**

1. In combination with records and a record holder, said record holder being carried by a handle, said record holder while being carried has a base and downwardly extended side

member on two opposite ends of said base, and extending across said side members are plural record holder post members, said record holder is also supported on a surface having said side members supported on said surface while said side members are inverted substantially 180 degrees from the hand



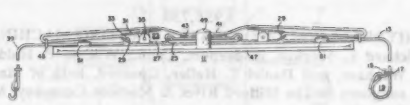
carried position, said record holder while in the supported position having brace means connected to said side members adjacent said supporting surface, said record holder having said record post members extending outwardly from only a side member while said record holder is supported on said surface.

3,955,734

TOW STRAP ASSEMBLY

Dean C. Reese, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 2, 1975, Ser. No. 538,299
Int. Cl.² B65D *71/00*
U.S. Cl. 224—58 **3 Claims**



1. A carrier for support of an object comprising:

a connector secured between terminals for engagement with spaced portions of the object for the support and said terminals provided with bands enclosing said connector and with hooks secured to the ends thereof for engagement with said bands to enclose the spaced portions of the object, a link disposed for removable connection between intermediate portions of said connector to form a loop therein and limit the portions thereof providing the support, and with said link provided with a pair of clamps disposed for respective removable engagement with said connector at the intermediate points, a bar and a keeper disposed on each of said clamps with said keeper provided with a serrated edge and pivoted for releasable spring-biased engagement thereof to wedge said connector against said bar, said link also having a member secured between said clamps; and a fastener disposed to removably secure the center of said connector to said member.

3,955,735

APPARATUS FOR OPENING EXPENDABLE FILM CARTRIDGES

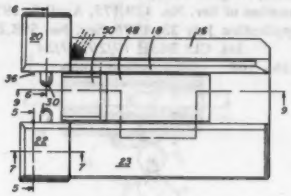
Robert S. Rosborough, Jr.; Mark J. Devaney, both of Rochester, and Luther M. Wright, Brockport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 25, 1973, Ser. No. 409,507
Int. Cl.² B26F *3/00*
U.S. Cl. 225—103 **5 Claims**

1. In a cartridge opening apparatus for opening cartridges of the type having supply and take-up chambers connected by an intermediate part wherein one of said chambers has a spool provided with a bore and containing film wound thereon, the combination comprising:

support means for supporting said cartridge;

spindle means separate from said support means and including a spindle movable while the cartridge is being supported by said support means to an active position in which said spindle is inserted within said bore of said spool of said cartridge for positioning and retaining said spool and said one chamber in a predetermined position, said spindle means further including a chisel movable to



an active position for engaging and opening said one chamber;

means for moving said spindle and said chisel of said spindle means together as a unit to said active position for substantially simultaneously positioning the spool and said one chamber and opening said one chamber; and

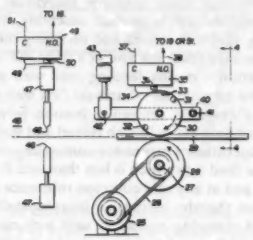
means for mounting said support means for movement relative to said spindle means in a direction transverse to the spindle axis after the said one chamber has been opened for separating said cartridge from said spool.

3,955,736

PUNCHED TAPE CONTROL SYSTEM

John W. Papsdorf, Lake Orion, Mich., assignor to Cardinal of Adrian, Inc., Dryden, Mich.

Division of Ser. No. 477,753, June 10, 1974, Pat. No. 3,915,040. This application July 23, 1975, Ser. No. 598,472
Int. Cl.² B65H *17/40, 25/16*
U.S. Cl. 226—6 **4 Claims**



1. A method for advancing, feeding, measuring and cutting to length stock in response to a program on a tape, said tape having a plurality of parallel longitudinal tracks, one of said tracks having sprocket holes for advancing said tape, said tape including a plurality of data bits, each bit being defined as the tracks in a transverse portion of the tape having a length sufficient to include only one sprocket hole, the improvement comprising:

incrementally advancing the tape one data bit at a time by rotating a drive sprocket,

sensing the presence or absence of perforations in each track and providing an output in response thereto;

advancing said stock a predetermined distance in response to the presence of a sprocket hole; and

rotating said drive sprocket to advance said tape another data bit when said stock has been advanced said predetermined distance;

whereby the number of consecutive data bits having a sprocket hole but no other perforations is proportional to the length of stock advanced.

3,955,737

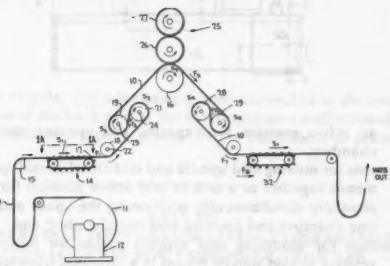
WEB FEED APPARATUS

John E. Traise, Lewiston, N.Y., assignor to Moore Business Forms, Inc., Niagara Falls, N.Y.

Continuation of Ser. No. 459,175, April 8, 1974. This application July 23, 1975, Ser. No. 598,288

Int. Cl.² B65H *17/20, 17/24*

U.S. Cl. 226—108 **6 Claims**



1. In an apparatus operative on a continuous web, including web infeed and metering means for forwardly feeding and metering said web at a predetermined displacement rate, and web operational means located posterior to said web infeed and metering means which is capable of effecting a feeding of said web, wherein differential in web tension anterior and posterior to said web operational means can exceed the holding strength and elastic elongation error range desired by said web infeed and metering means and which can be of sufficient magnitude to result in corresponding positional realignment of said web and which can result in subsequent registrative length mismatch when multiple individual processed webs must be maintained in mutual assembly, the improvement comprising said web infeed and metering means feeding at a first web surface feed rate and at a first web tension level, said web operational means feeding said web at a second web surface feed rate not less than said first web surface feed rate and at any common reference tension level, web snubbing rolls located between said web infeed and metering means and said web operational means for controlling said web at a third roll surface feed rate which is less than said first or said second feed rates and at any said common reference tension level, the web tension thereby increasing incrementally from said web infeed and metering means to said web operational means, whereby said first web tension at said web infeed and metering means is isolated from the web tension present anterior to said web operational means so that desired metering accuracy at said first web tension level at said web infeed and metering means is maintained.

3,955,738

VARIABLE INCREMENT FORM FEED MECHANISM

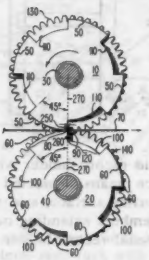
Anthony Horak, Detroit, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 20, 1974, Ser. No. 525,496

Int. Cl.² B65H *17/26*

U.S. Cl. 226—140 **9 Claims**

1. In a device for variably advancing forms and web media comprising means including a first and second plurality of camming surfaces disposed on and fixed to a pair of parallel and rotatable shafts and effective for incrementally advancing a said form or web medium relative to and between said pair of shafts, a first gear axially disposed on and fixed to an improved first of said pair of shafts, a second gear axially disposed on and fixed to an improved second of said pair of shafts and operatively meshed with said first gear for consistent tracking therewith and whereby the phase relationship between said first and said second pluralities of camming surfaces is maintained during the rotation of said pair of shafts,



and improved means for selectively altering the phase relationship as between said first and said second pluralities of camming surfaces such that the incremental advance of said forms and web media thereby may be varied according to a selected distance per each increment of advancement, said improved first and second shaft comprising:

said first shaft being rotatably mounted and said second shaft being rotatably and translatably mounted.

3,955,739

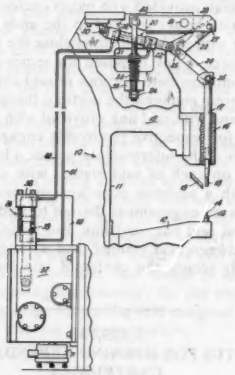
HYDRAULICALLY OPERATED RIVETING MACHINE

Richard L. Markus, Bridgeport, Conn.; William P. Hidden, Wenham, and Daniel F. Hefler, Concord, both of Mass., assignors to The Milford Rivet & Machine Company, Milford, Conn.

Filed Dec. 30, 1974, Ser. No. 537,603

Int. Cl.² B21J *15/20*

U.S. Cl. 227—1 **11 Claims**



1. A hydraulically actuated riveting machine comprising a frame, means on the frame for supporting a driver for reciprocating movement, anvil means aligned with the driver for cooperation therewith to upset a rivet, a power cylinder having a movable power piston, means interconnecting the power piston to the driver for transmitting movement of the piston into movement of the driver, a pump cylinder having a movable pump piston, means for actuating the pump piston for a

riveting cycle, means for transferring the pump piston movement into a relatively corresponding movement of the power piston each cylinder having a housing having a fluid port adjacent each end, a one passageway connected between a port on each cylinder and a second passageway connected between the other two ports to form a closed hydraulic circuit that includes hydraulic fluid contained within the passageways to effect communication between the two cylinders and in which there are pressure relief means for limiting the maximum pressure in the hydraulic circuit with said pressure relief means including a settable pressure relief valve connected between a reservoir and the one passageway and a one way check valve connected between said reservoir and the second passageway with said pressure relief valve being set to permit flow therethrough at the maximum pressure desired in the one passageway whereby movement of the pump piston producing pressure in excess of the maximum pressure has fluid diverted to the reservoir through the pressure relief valve without corresponding movement of the power cylinder piston.

3,955,740

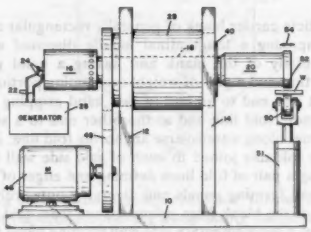
VIBRATORY SEAM WELDING APPARATUS

Andrew Shoh, Ridgefield, Conn., assignor to Branson Ultrasonics Corporation, New Canaan, Conn.

Filed June 9, 1975, Ser. No. 584,777

Int. Cl.² B23K *1/06*

U.S. Cl. 228—1 **6 Claims**



1. A vibratory seam welding apparatus comprising:
a cylindrical housing;
a stationary support;
bearing means supporting said housing for rotation in said support;
an electroacoustic converter for providing mechanical vibrations responsive to applied electrical energy of predetermined frequency;
a resonator coupled to said converter and being rendered resonant as a half wavelength resonator responsive to the vibrations from said converter whereby said converter and resonator in combination are resonant along their longitudinal axis;
a pair of metallic diaphragms secured to said housing and coupled to said converter and resonator combination at respective antinodal regions of longitudinal motion for disposing said converter and horn substantially concentrically relative to said housing;
drive means coupled for rotating said resonator relative to said support, and
anvil means disposed opposite said resonator for supporting a workpiece and urging it into contact with a radially disposed workpiece engaging surface of said resonator to provide a seam weld responsive to said resonator being resonant and rotating.

3,955,741

EXPLOSIVELY OPERATED WELDING CARTRIDGE

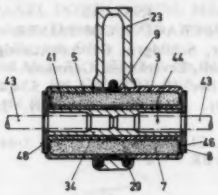
Peter Hofer, Hofen, Switzerland, assignor to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Continuation-in-part of Ser. No. 331,883, Feb. 12, 1973, Pat. No. 3,875,326. This application Feb. 4, 1975, Ser. No. 546,888

Claims priority, application Switzerland, Feb. 29, 1972, 2920/72

Int. Cl.² B23K *21/00*

U.S. Cl. 228—2.5 **11 Claims**



1. A cartridge for connection-by-explosion of rod-like metal members comprising a metal sleeve and a housing of annular shape surrounding said sleeve and provided with a central channel for receiving the metal members to be connected and an annular space for receiving an explosive to be ignited, said housing consisting of two parts adhesively joined together, and an ignition strip surrounding the annular explosive layer for detonating said layer.

3,955,742

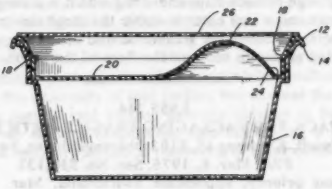
CONTAINER LID WITH INTEGRAL REMOVABLE EATING UTENSIL

Paul W. Marshall, 3507 E. 21st; Darrell F. Beaver, 5012 S. 68 East Ave., both of Tulsa, Okla. 74145, and Lawrence M. Thomas, 211 S. 117 East Place, Tulsa, Okla. 74128

Filed Feb. 24, 1975, Ser. No. 552,237

Int. Cl.² B65D *3/00*

U.S. Cl. 229—1.5 C **2 Claims**



1. A container for edible material, comprising:
an upright open top vessel having a circumferential upper lip;
a lid of thin, imprevious material having an outer edge shaped to removably sealably engage the circumferential upper lip of said container when pressed thereagainst, the outer edge of the lid sealably fitting the upper internal circumferential top portion of said vessel and the lid having a circumferential portion conforming to said circumferential upper lip of said vessel and the edge of the lid extending down over and externally of said vessel circumferential upper lip, the lid having an integrally formed eating utensil, the utensil being outlined by a notch of reduced thickness of the lid material, the notch beginning at a first point on the edge of the lid, the notch extending around the total perimeter of the defined utensil and terminating at a second point on the edge of the lid spaced from said first point, the notch adjacent the first and second points on the external circumferential

downwardly extending lid edge being cut through the lid material for a short distance from the lid edge, the portion of the downwardly extending edge of the lid between said first and second points providing a finger grip area externally of said vessel circumferential upper lip whereby the portion of the lid may be pulled upwardly, tearing the lid along the notch beginning with the cut through portions so that the defined utensil may be detached from the remainder of the lid.

3,955,743

PACKAGING CONTAINER

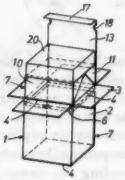
Rolf Tanneberger, Schildgen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 19, 1974, Ser. No. 534,408

Claims priority, application Germany, Jan. 8, 1974, 2400738

Int. Cl.² B65D 5/54, 25/14, 5/44

U.S. Cl. 229—14 BE **10 Claims**



1. A packaging container, comprising an outer box comprising lid flaps and side walls separated by folds; an insert arranged inside the outer box and having lid flaps and side walls separated by folds, which folds are situated at the height of the folds of the lid flaps of the outer box, one lid flap conforming to the cross-section of the insert and having a transversely extending fold while the three remaining flaps are shorter, all the flaps being joined to each other by folds and those flaps which are adjacent to the large flap having folds extending from the bottom corner of each of the flaps to the middle of the top edge of each flap; and a bag which is arranged inside the insert and which extends above the three shorter flaps of the insert and above the transverse fold of the large flap and is bonded to one or more of the flaps of the insert.

3,955,744

PACK FOR PACKAGING FRAGILE ARTICLES

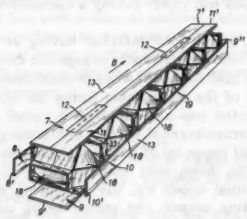
Toni Casutt, Kirchweg 45, 8102 Oberengstringen, Switzerland

Filed Mar. 6, 1975, Ser. No. 556,132

Claims priority, application Switzerland, Mar. 8, 1974, 3268/74

Int. Cl.² B65D 5/48

U.S. Cl. 229—28 R **11 Claims**



1. A pack for fragile articles, in particular eggs, comprising a plurality of parallel supporting webs extending in the longitudinal direction of the packing material each comprising a corrugated strip (2), the corrugations of the strip having top portions formed with fold lines (32, 33);

and a strip-like covering band (3) fixed thereto, which covering band (3) is located on the outside of the pack when in use, said covering band being secured to its corresponding corrugated strip opposite the top portions, thereof the supporting webs (7–11) being connected with one another only on the top portions of the corrugations (5) at the fold lines (32, 33) whereby the supporting webs (7–11) can be placed around the articles (18) to be packed by bending along the said fold lines (32, 33).

3,955,745

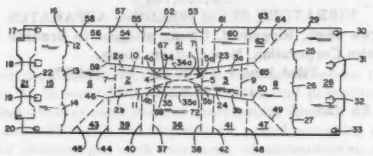
BLANK FOR AN ARTICLE CARRIER

Homer W. Forrer, Jonesboro, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed May 23, 1975, Ser. No. 580,300

Int. Cl.² B65D 5/46

U.S. Cl. 229—30 **5 Claims**



1. An article carrier blank of generally rectangular configuration comprising a longitudinal handle disposed approximately medially of the blank and having a hand gripping central portion and a pair of weight suspending portions each adjoined at one end to an end of said hand gripping portion along a handle fold line and at the other end to a side wall forming panel along a transverse anchoring fold line, a pair of web panels foldably joined to each of said side wall forming panels along a pair of fold lines defining end edges of each of said side wall forming panels and diverging outwardly to the side edges of the blank from points spaced from said anchoring fold line, a supplementary side wall forming panel foldably joined to each of said web panels along a transverse elevating fold line which is spaced from the associated anchoring fold line in a direction longitudinally outward from the associated weight suspending portion of said handle, an end wall forming panel foldably joined at its ends to each pair of said supplementary side wall forming panels along transverse fold lines, and a bottom forming panel foldably joined to each of said side wall forming panels along a transverse fold line remote from said anchoring fold line.

3,955,746

PACKAGE MADE FROM PAPER, CARDBOARD, CELLULAR CARDBOARD AND LIKE MATERIALS

Per Olof Christer Engman, Hagersten, Sweden, assignor to Svenska Traforskningsinstitutet, Stockholm, Sweden

Filed Dec. 5, 1973, Ser. No. 421,800

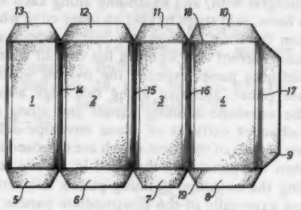
Claims priority, application Sweden, Dec. 12, 1972, 16205/72

Int. Cl.² B65D 5/02

U.S. Cl. 229—37 E **7 Claims**

1. A method for producing a package having a number of planar panels therein by punching a blank from paper, cardboard, corrugated cardboard and like material, providing said blank with fold lines, impregnating the material with a thermosetting resin only within narrow zones along such fold lines and at the edges of the blank which in the erected state of the package form corners or edges subjected to compression

loads, the remainder of the material of the blank being free from such impregnating substance, and erecting the blank to



form a package, the thermosetting resin being hardened to provide reinforcing zones in the package.

3,955,747

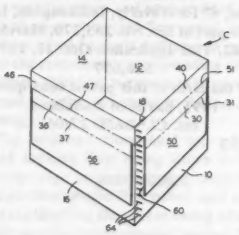
CONTAINER WITH TOP-LIFTING FLANGE

John T. Bell, St. Charles, Ill., assignor to Container Corporation of America, Chicago, Ill.

Filed July 30, 1975, Ser. No. 600,354

Int. Cl.² B65D *5/02*

U.S. Cl. 229—37 E **1 Claim**



1. In a collapsible shipping container, formed of a unitary blank of paperboard, having a top-lifting flange arrangement for engagement by vertically extending blades of a lift truck, the combination of:

a. first, second, third, and fourth side wall panels serially joined to each other at their side edges;

b. a relatively narrow, elongated retaining flap foldably connected to said fourth side wall panel and disposed to overlie a marginal portion of said first side wall panel to form a tubular structure;

c. bottom closure flaps foldably connected to the lower ends of said side wall panels and securable to each other in overlapped relation for closing the lower end of said tubular structure;

d. top closure flaps securable to each other in overlapped relation for closing the upper end of said tubular structure;

e. a plurality of flange members foldably connecting each of said top closure flaps to a related side wall panel;

f. each of said flange members including:

i. an inner flange element foldably connected at its upper edge to the upper edge of a related side wall panel and being folded outwardly and downwardly 180° to lie in full-face engagement with the outer surface of said related side wall panel;

ii. an outer flange element foldably connected at its lower edge to the lower edge of said first element, foldably connected at its upper edge to an edge of a related top closure flap, and being folded upwardly 180° to lie in full-face engagement with the outer surface of said inner flange element;

g. the outer flange element and the top closure flap which are related to said first side wall panel being recessed at one side thereof to expose the part of said marginal portion of said first side wall panel which is below the related inner flange element;

h. said retaining flap being secured to said marginal portion of said first side wall panel and to the related inner flange element.

3,955,748

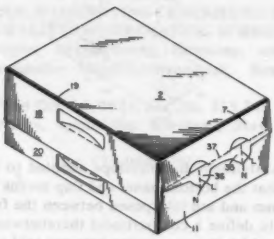
PANEL INTERLOCKING MEANS

Rodney K. Calvert, Dunwoody, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Mar. 21, 1975, Ser. No. 560,956

Int. Cl.² B65Q *5/66*

U.S. Cl. 229—44 R **8 Claims**



1. Interlocking means for securing two panels together in overlapping relation, said interlocking means comprising a locking tab joined to one of the panels along a fold line and having an integral locking toe and an integral locking heel extending in opposite directions and generally transverse to said fold line, a locking aperture formed in the other panel and having a locking edge for engaging said locking heel upon insertion of said locking heel into said locking aperture in coordination with folding of said locking tab along said fold line out of the plane of said one panel and relative movement of the panels toward each other, and said locking toe being of a size and configuration different from said aperture so that swinging movement of said locking tab causes edge portions of said locking toe other than its medial extremity to overlap corresponding parts of said other panel while simultaneously allowing the extremity of said locking toe to clear the corresponding part of said locking aperture thereby to fold said locking tab along a longitudinal fold line during a locking operation without substantial transverse bending of said locking tab.

3,955,749

EXPANSIBLE ENVELOPE

Eugene Turkenkopf, 1323 Taft Road, Teaneck, N.J. 07666

Filed June 28, 1974, Ser. No. 484,141

Int. Cl.² B65D *31/10*

U.S. Cl. 229—61 **18 Claims**

1. An expansible envelope for shipment, sending or mailing items and being formed from a one-piece unitary blank cut and folded into a substantially flat condition to define:

a. a rear panel having a top edge, a bottom edge, a right side edge and a left side edge;

b. a front panel overlying said rear panel and having a top edge, a bottom edge, a right side edge and a left side edge, the dimension between the right side edge and left side edge at substantially any location on the front panel being essentially the same as the dimension between the right side edge and left side edge at a corresponding location on the rear panel;

c. a bottom panel extending between and integral with each of said front and rear panel bottom edges, the bottom

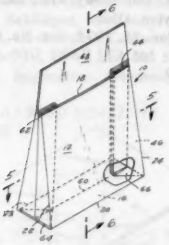
panel being free of any adhesive to permit the substantially flat envelope to be expanded;

d. right side flap means extending outwardly from one of said right side edges;

e. left side flap means extending outwardly from one of said left side edges;

f. right securing means securing portions of said right side flap means to the other of said right side edges;

g. left securing means securing portions of said left side flap means to the other of said left side edges;



h. the substantially flat envelope adapted to be expanded such that the bottom panel and flap means extend laterally from and are interposed between the front and rear panel to define a compartment therebetween, said compartment having an opening between said top edges and all of said flap means and said securing means being disposed intermediate one of said top edges and said bottom panel in expanded condition of the envelope;

i. a cover flap extending from said one top edge, said cover flap being foldable over the other top edge to thereby overlie said opening; and

j. said cover flap adapted to be secured in a position in which said cover flap overlies said opening.

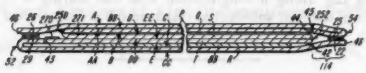
3,955,750

MULTI-PANEL ENVELOPE FORM

Harold W. Huffman, 2100 John Gray Road, Fairfield, Ohio 45014

Filed May 13, 1974, Ser. No. 469,672

Int. Cl.² B65D 27/10

U.S. Cl. 229—69 **12 Claims**

1. As a new article of manufacture, a continuous series of end-interconnected stuffed-envelope-defining forms fabricated from a single, endless web, wherein each form comprises a series of five or more end-interconnected panels, the first and last of which define the front and rear panels of a mailer envelope, and the intermediate panels of which define an envelope stuffer, each envelope-defining panel having an outer transverse end-edge in connected relationship with an adjacent, outer transverse end-edge of the envelope-defining panel of an adjoining form, and an inner transverse edge which is disposed in connected relationship with an adjacent transverse end-edge of an adjoining intermediate panel; and wherein the transverse end to transverse end height of each intermediate panel is less than the distance between the inner and outer transverse end edges of each envelope-defining panel; transverse perforations adjacent and spaced from the inner transverse end edge of one of said envelope-defining panels, the interconnected transverse end edge of the adjoining intermediate panel, and the outer transverse end edge of the other of said envelope-defining panels, said perforations defining in each of said panels a stub and a line of tear along which said stub is removable from said panels; a removable tear-strip integral with, and extending along each side of the panels of a form, said strips having an inner edge which, when severed from the form, defines the overall side-to-side width of each panel thereof and wherein the overall width of each envelope-defining panel exceeds the overall width of each intermediate panel; adhesive along side-edge adjacent surfaces of the envelope-defining panels and along transverse end-edge adjacent surfaces of those envelope-defining and intermediate panels of the form which are disposed in abutting contact when the panels are disposed in zig-zag relationship for disposing the envelope-defining panels in overlying relationship and externally of the intermediate panels; said form being further characterized in that the side edges of the intermediate panels are spaced inwardly from and free of connection with the side edges of the envelope-defining panels and the transverse end edges of the intermediate panels are integral with and releasably connected to adjacent transverse end-edges of the envelope-defining panel; and wherein only the transverse end-edge of that intermediate panel which adjoins one of said envelope-defining panels is in registry with the outer transverse end-edge of the other envelope-defining panel of the form when the panels are disposed in zig-zag relationship.

3,955,751

MAILING DEVICE

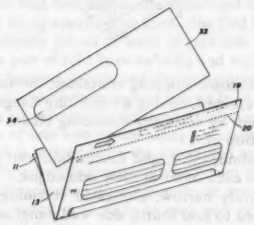
David R. Mayne, 6719 Waverly, Indianapolis, Ind. 46220

Continuation-in-part of Ser. No. 233,270, March 9, 1972, Pat. No. 3,843,042. This application Oct. 21, 1974, Ser. No. 516,677

The portion of the term of this patent subsequent to Oct. 22, 1991, has been disclaimed.

Int. Cl.² B65D 27/06

U.S. Cl. 229—73 **12 Claims**



1. A mailing device comprising:

a first and second parallel paper sheet each having a top stub portion attached together, said first sheet having a sender section and a receiver section, said second sheet being removable therefrom, said first and second sheet being folded thereby defining a fold and positioning said second sheet inward of said first sheet, and said sender section and said receiver section on the same side of the fold;

a return envelope having a first window in registry with said sender section when said stub portion of said first sheet is removed therefrom and said first sheet is removed from said second sheet and said first sheet is folded along said fold and inserted in said envelope; and,

a sending envelope containing said first and second sheet in said folded condition and said return envelope enclosed in said sending envelope, said sending envelope having a second window in registry with said receiver section;

said first sheet having a top edge spaced a fixed distance from said first fold, said sending envelope having an interior length not less than said distance and approximately equal thereto preventing excessive lengthwise

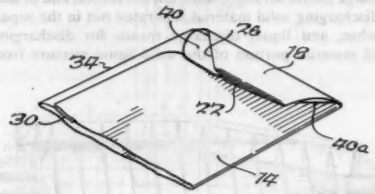
shift of said first sheet and movement of said receiver section with respect to said second window.

3,955,752

LOCKING ENVELOPE

Richard V. Harrigan, Tonawanda, N.Y., assignor to Niagara Envelope Company, Buffalo, N.Y.

Filed Apr. 28, 1975, Ser. No. 572,142
Int. Cl.² B65D 27/22
U.S. Cl. 229—84 7 Claims



1. An envelope formed of a single sheet of paper or the like, comprising:

a first panel having a top and a bottom edge and two side edges,

a second panel, said second panel having a top and a bottom edge and two side edges and being folded into juxtaposed position with respect to said first panel, said corresponding top edges of said panels defining an opening therebetween and the remaining corresponding edges not including a common fold line between said panels being adhesively joined together whereby to define a pocket below said opening,

a locking flap attached along said top edge of said first panel, said locking flap being down folded from said attached top edge in over-lapping, adjacent relation to the upper portion of said first panel, and at one side edge portion of said locking flap there being adhesive means of such extent as only to secure said locking flap at said one side edge portion to the correspondingly adjacent, underlying portion of said envelope with the opposite side edge portion of said locking flap being unsecured with respect to the correspondingly adjacent, underlying portion of said envelope,

a closure flap having an inner edge and an outer edge, said closure flap being attached along said inner edge to and extending from said top edge of said second panel; and

a tuck flap, said tuck flap being attached to and extending from said outer edge of said closure flap and being off-set from the longitudinal centerline of said envelope toward said unsecured opposite side edge portion of said locking flap so that said tuck flap is insertable under said unsecured side edge portion of said locking flap when said closure flap is juxtaposed to said locking flap.

3,955,753

GAS CENTRIFUGE WITH DRIVING MOTOR

William H. Dancy, Jr., Charlottesville, Va., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 13, 1961, Ser. No. 102,898
Int. Cl.² B01D 21/26
U.S. Cl. 233—1 C 4 Claims

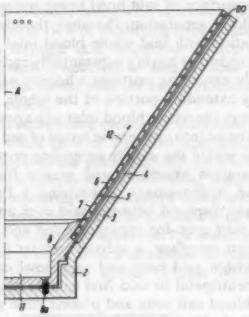
1. A centrifuge for separating gaseous constituents of different masses comprising a vertical tubular rotor, means for introducing a gas mixture of different masses into said rotor and means for removing at least one of the gas components from the rotor, a first bearing means supporting said rotor at one end for rotational movement, a support, a damping bearing mounted on said support, a shaft fixed to said rotor at the opposite end and mechanically connecting said rotor to said damping bearing, a cup-shaped tube of electrically conductive, non-magnetic material in coaxial relationship with said shaft, the open end of said tube extending away from said rotor and the closed end of said tube being directly secured to the adjacent end of the rotor, an annular core of magnetic material fixedly mounted on said support so as to be disposed within said tube and around said shaft, and a second annular magnetic core with coils arranged thereon to receive polyphase current to produce a rotating magnetic field traversing the circumference of said tube, fixedly mounted on said support so as to surround said tube, the size of said first annular core and said second annular core being such as to permit limited radial displacement of said shaft and said tube.

3,955,754

CONTINUOUSLY OPERATING CENTRIFUGE HAVING A PLURALITY OF SEPARATING SCREENS

Helmut Schaper, Braunschweig, Germany, assignor to Braunschweigische Maschinenbauanstalt, Braunschweig, Germany

Filed Oct. 16, 1974, Ser. No. 515,348
Claims priority, application Germany, May 24, 1974, 2425105
Int. Cl.² B04B 7/16
U.S. Cl. 233—2 12 Claims



1. In a continuously operating centrifuge for separating solids from a fluid mixture, of the type including a frusto-conical drum having a substantially vertical axis with its greater diameter end at the upper end thereof, a screen structure comprising a first frusto-conical cover screen coaxially mounted within said drum for rotation therewith and radially spaced from the inner surface of said drum, said first screen having its larger diameter end at the upper end thereof and a dished feed member mounted at the lower end of said drum for rotation therewith, for directing material to be separated onto said screen structure; the improvement wherein said screen structure further comprises a second cover screen, and means supporting said second cover screen on said first cover screen spaced radially inwardly of said first cover screen, said second cover screen having holes that are substantially larger than the holes of said first cover screen.

3,955,755

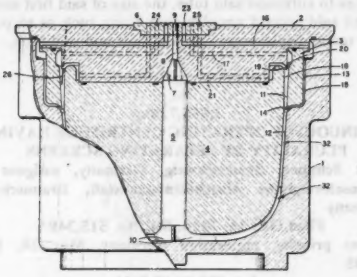
CLOSED CONTINUOUS-FLOW CENTRIFUGE ROTOR

Julian P. Breillatt, Jr., Oak Ridge; Carl J. Remenyik, Knoxville; Walter K. Sartory, Oak Ridge; Louis H. Thacker, Knoxville, all of Tenn., and William Z. Penland, Bethesda, Md., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 25, 1975, Ser. No. 571,667

Int. Cl.² B04B *11/04*

U.S. Cl. 233—3 **5 Claims**



1. In concentrically continuous flow centrifuge having a rotor for separating the red blood cell, white blood cell, and plasma components of whole blood into separate zones said rotor comprising a rotatable bowl a closure for said bowl, a generally parabolic core defining an axially extending central whole blood inlet passageway, said core disposed substantially concentricaaly within said bowl the periphery of said core and the interior surface of said bowl being spaced apart to define a whole blood separation chamber therebetween in liquid communication with said whole blood inlet passageway, said separation chamber having substantially radially and substantially axially extending portions whereby whole blood enters the radially extending portion of the whole blood separation chamber from the whole blood inlet passageway and is centrifugally separated into concentric zones of red cells, white cells, and plasma within the axially extending portion of the whole blood separation chamber, and means for extracting said plasma, the improvement comprising a first annular fluid splitter blade disposed between said core and said bowl concentric to said core for separating red and white blood cell zones at their interface, a second annular fluid splitter blade disposed within said core and said bowl concentric to said core and centripetal to said first splitter blade for separating the white blood cell zone and plasma zone at their interface, and said whole blood separation chamber being shaped such that its width decreases with increasing radial distance from the axis of rotation of said rotor such that during operation of said centrifuge the velocity gradient at the walls of said whole blood separation chamber is maintained below about 5 sec^{-1}.

3,955,756

SOLID-SHELL SCREW-CONVEYOR CENTRIFUGE

Georg Hiller, Vilsbiburg, Germany, assignor to Flottweg-Werk, Dr. Georg Bruckmayer GmbH & Co. KG, Vilsbiburg, Germany

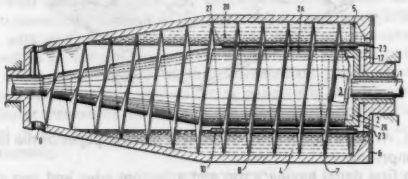
Filed June 21, 1972, Ser. No. 264,872

Claims priority, application Germany, June 21, 1971, 2130633

Int. Cl. B04b *1/20, 7/02*

U.S. Cl. 233—7 **11 Claims**

1. A screw-conveyor centrifuge for the continuous separation of solid-liquid mixtures comprising: a longitudinally extending rotatable bowl having inwardly facing surfaces defining a hollow space, a longitudinally extending conveyor screw means arranged in said bowl for relative rotation with respect to said bowl, said screw means including a centrally disposed hub means and helically wound screw fligh means extending radially outwardly from said hub means, the outer radial dimensions of said flight means corresponding to the inwardly facing surfaces of said bowl, said flight means extending from adjacent a first end of said bowl corresponding to the beginning of the conveyor path of said screw means to adjacent the second end of said bowl corresponding to the end of said conveyor path, a separating chamber formed between the hub means and the inwardly facing surfaces of the bowl, feeding means for feeding the solid-liquid mixture to the separating chamber at a position adjacent the first end of the bowl, solid discharge means arranged adjacent the second end of the bowl for discharging solid material separated out in the separating chamber, and liquid discharge means for discharging the liquid material portion of the solid-liquid mixture from the



bowl; wherein said liquid discharge means includes: at least one liquid discharge opening terminating in the separating chamber at a receiving point which is at a distance in the conveying direction from the first end of the bowl, drain chamber means separated from said separating chamber, at least one drain port leading to the outside from said drain chamber means, and drain conduit means extending along the screw means from the liquid discharge opening to the drain chamber means, wherein the drain conduit means extends in an axial direction along at least that portion of the length thereof which is adjacent the drain chamber means, and wherein the drain conduit means terminates with an open end thereof facing said drain chamber means in axial alignment with said at least one drain port for accommodating access to said drain conduit means from the outside by way of the at leat one drain port, and wherein said drain conduit means is positioned radially outwardly from said hub means.

3,955,757

ULTRACENTRIFUGE FOR SEPARATING FLUID MIXTURES

Ralph A. Lowry, Charlottesville, Va., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Sept. 28, 1960, Ser. No. 59,127

Int. Cl.² B04B *11/00*

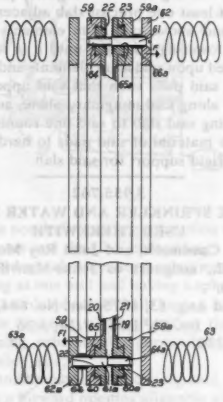
U.S. Cl. 233—19 R **8 Claims**

1. A centrifuge for the separation of fluid mixtures having light and heavy fractions comprising a cylindrical rotor, disc type end-plugs closing the ends of the rotor, means for mounting said rotor for rotation about its cylindrical axis, a housing member enclosing the rotor, a vacuum chamber in said housing about the central portion of the rotor, a collection chamber at each end of the housing, the innermost side of which is substantially formed by the outer face of the end-plug, means for preventing flow of the fluid from the collection chambers to said vacuum chamber, at least one of said end-plugs having a plurality of holes therethrough communicating between the collection chamber adjacent thereto and the inside of the rotor to induce countercurrent flow of the fluid in the centrifuge, means for feeding fluid to be processed into the centrifuge, means communicating with the collection chambers to extract the light and heavy separated fractions of the fluid, and means for rotating the rotor.

3,955,758
CENTRIFUGAL SEPARATING APPARATUS

Robert Loison, 86, route de Mantes, 78200 Buchelay, France

Filed Apr. 22, 1975, Ser. No. 570,351
Claims priority, application France, Apr. 25, 1974, 74.14505
Int. Cl.² B04B 1/14, 11/04
U.S. Cl. 233—20 R 12 Claims



1. In centrifugal separating apparatus, a rotatable drum comprising:

a. at least two parts;

b. frusto-conical walls of said parts cooperating to define a chamber to receive a component separated in the drum, said parts having adjacent edges spaced apart to define a circular outlet opening from the chamber;

c. lips of deformable material at said edges of the parts;

d. first ring means integral with one of said lips;

e. second ring means of soft iron spaced from said first ring means;

f. electro-magnet means cooperating with said second ring means whereby said second ring means forms an armature of said electro-magnet means; and

g. tie-rods connecting together said first and second ring means, whereby energisation of the electro-magnet means brings the lips selectively to an open or a closed position.

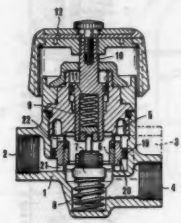
3,955,759
THERMOSTATIC MIXER FOR HYDRAULIC SYSTEMS

Alfons Knapp, Bleicherstrasse 3, Biberach an der Riss, Germany

Filed Oct. 23, 1974, Ser. No. 517,228
Claims priority, application Italy, Nov. 28, 1973, 70491/73
Int. Cl.² G05D 23/13
U.S. Cl. 236—12 R 9 Claims

1. In a thermostatic mixer comprising a body, in said body an inlet union for cold water, an inlet union for warm water and a delivery union for mixed water, an inner cavity of said body, communicating with said delivery union, inlet apertures for cold water communicating said inlet union for cold water with said inner cavity, inlet apertures for warm water communicating said inlet union for warm water with said inner cavity, a control valve cooperating with said inlet apertures for cold and warm water in view of modifying in opposite manners the free passages through said respective apertures, and a thermometric element connected to said control valve and immersed in said inner cavity near the communication thereof with said delivery union, said cold inlet and hot inlet apertures being of such area relative to one another that the volume of flow through the cold inlet apertures is less than the volume of flow through the hot inlet apertures when the valve is in symmetric position with respect to said inlet apertures, whereby in normal operation for delivering water at a predetermined temperature the control valve is caused to assume an asymmetric position, proximate to the throttling condition of the inlet apertures for warm water, and thus said control valve is in a condition to rapidly exert the necessary corrective action in case of accidental increase in temperature.

4. In a thermostatic mixer comprising a body, in said body an inlet union for cold water, an inlet union for warm water and a delivery union for mixed water, an inner cavity of said body, communicating with said delivery union, a tubular member separating said inner cavity from said inlet unions for cold and warm water, both ends of said tubular member having castellation-like denticulations comprising alternate projections and recesses, said denticulations at one end of said tubular member forming inlet apertures for cold water communicating said inlet union for cold water with said inner



cavity, and said denticulations at the opposite end of said tubular member forming inlet apertures for warm water communicating said inlet union for warm water with said inner cavity, a control valve cooperating with said inlet apertures for cold and warm water in view of modifying in opposite manners the free passages through said respective apertures, and a thermometric element connected to said control valve and immersed in said inner cavity near the communication thereof with said delivery union,

the improvement comprising means for increasing the resistance to the water flow of the inlet apertures for cold water with respect to the inlet apertures for warm water,

whereby in normal operation for delivering water at a predetermined temperature the control valve is caused to assume an asymmetric position, proximate to the throttling condition of the inlet apertures for warm water, and thus said control valve is in a condition to rapidly exert the necessary corrective action in case of accidental increase in temperature.

3,955,760
THERMOSTATIC AIR VALVE

Michael R. Ridenour, Fremont, Ind., and Jerry L. Zabonick, Hillsdale, Mich., assignors to Evans Products Company, Portland, Oreg.

Filed May 5, 1975, Ser. No. 574,317
Int. Cl.³ G05D 23/02; F16K 31/126
U.S. Cl. 236—86 3 Claims

1. A thermostatically operated air valve for communicating a source of compressed air with an air actuatable device at a pre-determined temperature comprising:

a. a valve body having a valve chamber having first and second ends;

b. a thermal sensor element having a push pin extending into the first end of said valve chamber;

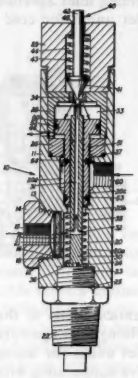
c. the second end of said valve chamber opening into the chamber of a cylinder;

d. an air delivery passageway in said valve body for communicating a source of compressed air with said valve chamber and an air exit passageway for communicating said valve chamber with the air actuatable device;

e. a reciprocal valve rod located in said valve chamber, one end thereof being in abutting relationship with said push pin and the other end thereof extending through the chamber of said cylinder, said valve rod having an axial bore therein communicating the chamber of said cylinder with said valve chamber and the source of compressed air;

f. a piston located within the chamber of said cylinder and slidably mounted on said reciprocal valve rod so that it is slidable therealong from a first position blocking communication between said valve chamber and said exit passageway to a second position opening communication between said valve chamber and said exit passageway;

g. an exhaust port in said cylinder communicating the chamber of and cylinder with the atmosphere; and



h. a retractable valving member seated in said exhaust port, said reciprocal valve rod being located relative to said retractable valving member such that upon extension of said push pin at the actuation temperature of said thermal sensor said valve rod contacts said retractable valving member at a location which seals the axial bore thereof and unseats said retractable valving member, thereby permitting air under pressure within said cylinder to escape through said exhaust port to the atmosphere and causing air entering said valve chamber to push outwardly against said piston thereby causing it to move from said first position to said second position opening communication between said exit passageway and said valve chamber.

3,955,761

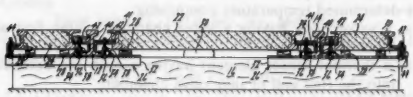
METHOD FOR PROVIDING A VEHICULAR SUPPORTING DECK FOR A RAILROAD GRADE CROSSING

Paul J. Szarka, and Joseph R. Szarka, both of Livonia, Mich., assignors to Szarka Enterprises, Inc., Livonia, Mich.

Division of Ser. No. 338,047, March 5, 1973, abandoned. This application Jan. 2, 1975, Ser. No. 538,134

Int. Cl.² E01B 1/00

U.S. Cl. 238—8 **9 Claims**



1. A method of providing a railroad grade crossing for a railroad comprising a pair of running rails supported upon a plurality of spaced apart ties which in turn are supported upon a roadbed, which includes the steps of,

selectively placing a plurality of shim elements adjacent one of said running rails and supporting said elements whereby the upper surfaces thereof lie along a predetermined imaginary plane arranged generally parallel to the upper surface of said running rail,

selectively placing a plurality of deformable pads having a material which will harden in time adjacent said one running rail and locating the uppermost portions of said pads at least as high as said imaginary plane,

orientating at least one precast slab adjacent said one running rail and above said shim elements and pads, and thereafter lowering said slab until it is supported above said roadbed upon said shim elements and simultaneously deforming said pads such that said uppermost portions thereof lie along said imaginary plane, and

fixedly securing said slab to said one running rail and permitting the material of said pads to harden and thereby become a rigid support for said slab.

3,955,762

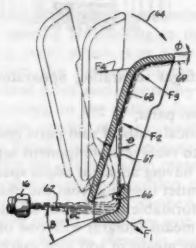
ROTATABLE SPRINKLER AND WATER DEFLECTOR USED THEREWITH

Peter Nicholas Cassimatis, and John Roy McComas, both of Fresno, Calif., assignors to Johns-Manville Corporation, Denver, Colo.

Filed Aug. 13, 1975, Ser. No. 604,391

Int. Cl.² B05B 3/14, 1/26

U.S. Cl. 239—230 **8 Claims**



1. In a rotatable sprinkler including a nozzle through which a jet of water issues and an oscillatable arm having an end movable in front of and to one side of said nozzle, a water deflector connected with said end and movable into and out of said jet, said deflector comprising:

a. first deflector means including a first curved surface movable into the axis of said jet, said curved surface

i. receiving water from said jet in a substantially turbulent free manner,

ii. causing said received water to form into a substantially smooth sheet along said surface, and

iii. directing said sheet of water in a first straight path which is at least approximately 90° from the axis of said jet;

b. second deflector means including a substantially straight surface spaced from said curved surface and extending at an acute angle with and in front of said first path, said straight surface

i. receiving said sheet or water in a substantially turbulent free manner, and

ii. causing said sheet to move along said straight surface in a second straight path at said acute angle with said first path; and

c. third deflector means including a second curved surface extending in front of and joining said straight surface, said second curved surface

i. receiving said sheet of water from said straight surface in a substantially turbulent free manner,

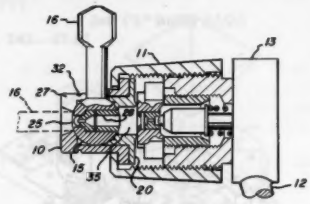
ii. causing said sheet to move along said second curved surface, and

iii. directing said sheet in a third straight path which is approximately parallel with the axis of said jet.

3,955,763
ROTATABLE SPRAY NOZZLE

Arlon R. Pyle, St. Louis Park, and William D. Vork, Edina, both of Minn., assignors to Graco Inc., Minneapolis, Minn.

Filed May 19, 1975, Ser. No. 578,544
Int. Cl.² B05B 15/02
U.S. Cl. 239—119 13 Claims

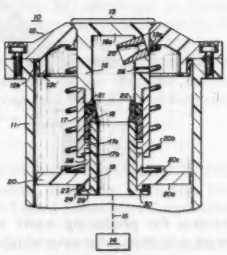


1. A rotatable nozzle for use in conjunction with a spray gun for spraying paints and the like, comprising:
   a. an elongated nozzle member having means for gripping and rotating at one end and having a spherical ball at the other end, said spherical ball having a passage therethrough for housing a spray orifice therein, and said passage being substantially perpendicular to the elongated member axis;
   b. a nozzle holder partially enclosing said nozzle member and having a forward opening alignable with said passage, and having a rear flange adapted for clamping toward said spray gun; and
   c. a sealing member of deformable material, having a forward spherical annular seating surface contacting said spherical ball and having a rear flange adjacent and rearward of said nozzle holder near flange.

3,955,764
SPRINKLER ADJUSTMENT

Charles W. Phaup, Dallas, Tex., assignor to Telsco Industries, Garland, Tex.

Filed June 23, 1975, Ser. No. 589,051
Int. Cl.² B05B 3/16
U.S. Cl. 239—206 8 Claims

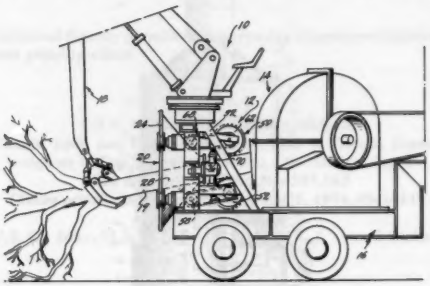


1. An adjustable nozzle for a pop-up sprinkler head having a cylindrical cover plate aperture through which the nozzle is to operate, which comprises:
   a. a hollow cylinder structure positioned in said aperture having a closed upper end and structure forming flow orifices through the side wall near said closed upper end for directing spray from said nozzle,
   b. a hollow nozzle drive tube structure positioned coaxially with and below said cylinder,
   c. normally enmeshed up facing and down facing clutch teeth carried by said cylinder and said drive tube, respectively, and
   d. resilient means positioned between confronting portions of said cylinder and said drive tube to permit downward movement of said cylinder relative to said drive tube to disengage said teeth and permit rotation of said cylinder relative to said drive tube for adjustment of the spray axis.

3,955,765
WHOLE TREE CHIPPER

Walden M. Gaitten, Sylacauga, Ala., assignor to Kockum Industries, Inc., Talladega, Ala.

Filed June 27, 1974, Ser. No. 483,824
Int. Cl.² B02C 18/06, 21/02
U.S. Cl. 241—28 35 Claims



32. A method of reducing successive cut whole trees lying on the ground to chips which comprises the steps of
   a. gripping successive cut whole trees at a position near but spaced from the butt end thereof,
   b. moving successive gripped cut whole trees longitudinally into a fixed feed position with the top portion of each successive whole tree supported by the ground without changing the position of gripping thereof,
   c. engaging opposed peripheral portions of the butt end of each successive whole tree at said fixed feed position,
   d. releasing the gripping action at said fixed feed position after the aforesaid engagement,
   e. progressively moving the engagement of the opposed portions of the butt end of each successive whole tree at said fixed feed position in a direction toward the top of the tree to thereby move the whole tree generally in a longitudinal direction, butt end first, into a fixed chipping position, and
   f. progressively cutting chips from the butt end of the tree at said fixed chipping position during the aforesaid movement of said tree therein.

3,955,766
PULVERIZING MILLS

Shien-Fang Chang, No. 55 Chung-Cheng Road, Hsin-Ying Chen, Tainan Hsien, China /Taiwan

Filed Oct. 12, 1971, Ser. No. 188,377
Int. Cl.² B02C 23/28
U.S. Cl. 241—56 3 Claims

1. Pulverizing apparatus comprising a vertical container having from bottom to top therein
   mounting seat means,
   air housing means having an air inlet means provided therein,
   speed reducing means disposed beneath said air housing means,
   lower housing means,
   grinding means disposed in said lower housing means,
   middle housing means having inlet means provided in the wall thereof,
   classifier means disposed in said middle housing above said grinding means,

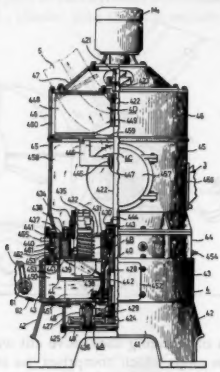
upper housing means having spiral outlet means extending from the wall thereof,

exhaust means disposed in said upper housing means,

motor seat frame means,

shaft means located substantially at the center of said container and extending vertically and connected to said speed reducing means, said grinding means, said classifier means and said exhaust means, one end of said shaft being supported by a collar means positioned centrally of said air housing means, and the other end of said shaft extending to the top of said vertical container,

drive means comprising motor means mounted on said seat frame means and gear means for driving said shaft means,



feed port means positioned adjacent said inlet means to receive raw material from a source,

supply adjustment means for adjusting the opening of said feed port means,

return pipe means connected to said adjustment means for returning unfed raw material to said source,

means disposed above said classifier means for removing said material ground by said grinding means in said middle housing means,

means disposed toward the lower portion of said vertical container for sweeping smaller sized objects of said material and carrying same to said grinding means,

air forcing means in said housing means for circulating said ground material upward and to said collecting means.

3,955,767

SECONDARY IMPACT CRUSHER

Mason R. Hise, 6603 Trumble SE., Albuquerque, N. Mex. 87108

Filed Mar. 5, 1975, Ser. No. 555,530

Int. Cl.² B02C *23/00*

U.S. Cl. 241—275 **2 Claims**

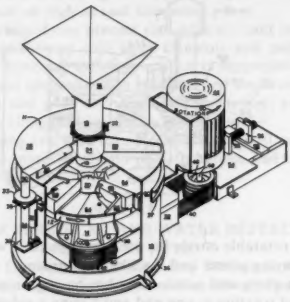
1. An impact crusher comprising:

an essentially cylindrical housing having a cylindrical wall;

means for controllably introducing aggregate to be crushed into said housing;

rotatable means for receiving said aggregate and for forcibly engaging it to hurl it outward, said rotatable means comprising an impeller table having essentially at its center a conical deflection means for receiving aggregate from said aggregate introducing means and for deflecting said aggregate outwardly therefrom over the impeller table, said rotatable means further comprising a plurality of shoe means, and bracket means for retaining said shoe means on said impeller table by slidable engagement therewith, each of said shoe means comprising diagonal surfaces and each of said bracket means comprising corresponding diagonal surfaces, the respective diagonal surfaces of said shoe means and said bracket means being slidingly engageable with one another, the ends of said diagonal surfaces closest to said impeller table being disposed radially outward from the ends of said diagonal surfaces disposed furthest above said impeller table;

means for rotating said rotatable means at a preselected speed;



means mounted on said cylindrical wall of said housing for receiving and impacting with said outwardly hurled aggregate, so as to break said aggregate down into smaller pieces of desired size; and

means for lubricating said rotating means.

3,955,768

APPARATUS FOR PRODUCING WASTE WRAPS AND THREAD RESERVE WINDINGS ON A BOBBIN TUBE

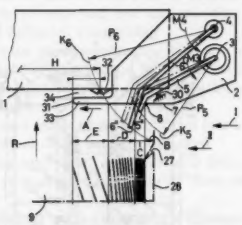
Jakob Fluck; Felix Graf, both of Winterthur, and Albert Ruegg, Pfaffikon, all of Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Apr. 21, 1975, Ser. No. 569,771

Claims priority, application Switzerland, Apr. 29, 1974, 5816/74

Int. Cl.² B65H *54/34*

U.S. Cl. 242—18 PW **10 Claims**

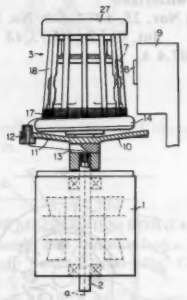


1. An apparatus for producing waste wraps and thread reserve wraps on a bobbin tube onto which there is wound a thread package and which is placed onto a rotating bobbin chuck and at an end portion of which there is provided a thread catching zone, comprising a first lever for producing the waste wraps, means for mounting said first lever to be pivotable with a delay, a second lever for producing the thread reserve wraps, means for mounting said second lever to be pivotable and axially offset with respect to the first lever as viewed from said end portion, means for providing a thread guide edge, both of said levers being pivotably arranged in such a manner that said levers are consecutively pivoted by the thread engaged by the rotating package tube and with different delays while thread wraps are wound beginning at the end portion and with the thread tending to move along the thread guide edge towards a central position.

3,955,769
YARN FEEDING DEVICE FOR KNITTING MACHINES

Toshihiro Kajiura, Osaka; Mitsuo Nagai, Settsu; Shin Tsukuma, and Akira Mizuno, both of Itami, all of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

Filed May 31, 1974, Ser. No. 474,904
Claims priority, application Japan, Nov. 2, 1973, 48-126495[U]
Int. Cl.² B65H *51/20*
U.S. Cl. 242—47.01 **4 Claims**



1. A yarn feeding device for knitting machines comprising a spindle, a mechanism for driving said spindle, a flyer (10) secured to said spindle, a conical shaped winding body (3) mounted on said spindle and disposed at an opposite side of said flyer with respect to said driving mechanism, said flyer (10) being provided with a yarn guide, whereby a yarn from a package is temporarily reserved on said winding body, characterized in that said winding body comprises:
1. a plurality of bars (18) arranged in conical form;
2. a plurality of resilient equi-radius members projecting radially from a locus proximate to the axis of said winding body and pivotally engaging one end of the bars (18);
3. a cap (27) disposed distally upon the spindle, said cap having tapering wall means engaging the opposite ends of said bars (18) from the ends pivotally engaging said equiradius members;
4. a changeable ring (26) adapted to be positioned concentrically of and supported by said spindle, the circumference of said ring providing medial support for said bars;

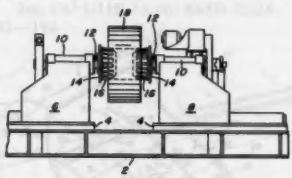
whereby the lateral displacement of said bars (18) is determined by the diameter of the ring and the relative spatial relationship between said cap (27) and said ring (26).

3,955,770
COIL SUPPORT FOR STRIP UNCOILER

Joseph V. Offermann, Hamilton Township, Mercer County, N.J., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Nov. 2, 1973, Ser. No. 412,076
Int. Cl.² B65H *19/02*
U.S. Cl. 242—68.4 **2 Claims**

1. In an uncoiler for deformable material having a base, a pair of independently movable coil supporting assemblies on said base, means for moving said assemblies and a horizontally disposed rotatable shaft mounted on each coil supporting assembly; an improved coil support for minimizing damage to the inner wraps of the coil material comprising a mandrel attached to the end of each shaft, a hub portion mounted on each mandrel, a removable sleeve mounted on each hub portion, each of said sleeves having a conical shaped surface for engaging the material of the eye of the coil, said surfaces each having a plurality of circumferentially spaced apart axially directed grooves and a plurality of lands, the area of the lands being substantially larger than the conical surface area removed by the grooves and with said sleeves being nitride

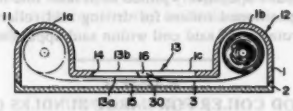


hardened thereby permitting groove edge chipping to increase coil gripping effect.

3,955,771
FILM MAGAZINE FOR CAMERAS

Chiseki Ishii, and Fumio Kobayashi, both of Omiya, Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Feb. 5, 1975, Ser. No. 547,163
Claims priority, application Japan, Feb. 5, 1974, 49-14119
Int. Cl.² G03B *1/04*
U.S. Cl. 242—71.2 **3 Claims**



1. In a film magazine for still cameras comprising a film feed-out chamber, a film take-up chamber and an intermediate portion extending between said chambers and having a rectangular exposure aperture, said intermediate portion forming therein a film passage extending between said chambers and communicated with said chambers, the improvement comprising a pair of slanted guide grooves formed one on each side of said aperture, the inner part of said guide grooves being nearer to the film take-up chamber than the outer part thereof, the width of said exposure aperture being large enough to allow the film in said film passage to be pulled out from the passage through said guide grooves.

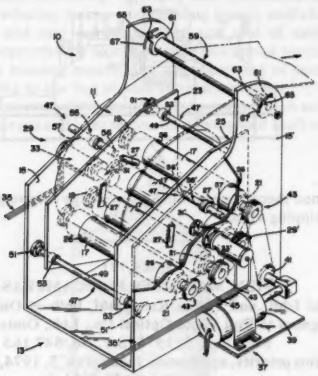
3,955,772
UNWINDING APPARATUS

James R. Chisholm, North Caldwell, and Joseph E. Smith, New Providence, both of N.J., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed May 8, 1975, Ser. No. 575,599
Int. Cl.² B21C *47/22*
U.S. Cl. 242—78.7 **7 Claims**

1. An apparatus for unwinding a substantially round coil of strip material, said apparatus comprising:
a frame including first and second opposingly positioned upstanding side members;
a plurality of spacedly positioned rollers for engaging the periphery of said coil over a substantial arc to rotate and position said coil within said apparatus, each of said rollers having a first end portion securedly positioned to said first upstanding side member of said frame and a second end portion securedly positioned to said second upstanding side member of said frame;
first and second opposingly positioned alignment members movably oriented within said apparatus substantially between said first and second upstanding side members for moving toward and away from each other to engage the sides of said coil and maintain alignment thereof;

motion means including a pair of hydraulically actuated piston members, each of said piston members operatively connected to one of said alignment members for imparting motion thereto to provide said movement of said



alignment members toward and away from each other; and

drive means operatively joined to at least one of said spacedly positioned rollers for driving said roller to provide said rotation of said coil within said apparatus.

3,955,773

WIRE ROD COILER FOR LARGE BUNDLES OR COILS

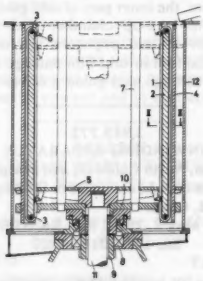
Franz Blinn, St. Ingbert, Saar, Germany, assignor to Moeller & Neumann GmbH, St. Ingbert, Saar, Germany

Filed Dec. 20, 1974, Ser. No. 535,012

Claims priority, application Germany, Dec. 24, 1973, 7345736

Int. Cl.² B21C *47/00*

U.S. Cl. 242—81 **2 Claims**



1. A wire rod coiler comprising a stationary pan having an upper open end, a circular base plate means rotatably mounted in said pan at the bottom thereof, a plurality of support structures mounted at mutually spaced locations at the periphery of said base plate means and extending upwardly therefrom, said support structures defining the radially outer limit of a coiling or reeling space, a coiler plate means disposed in said coiling or reeling space transverse to said support structures, and driving means for displacing said coiler plate lengthwise of said support structures, wherein each of said support structures supports a flexible, heat-resistant element operatively connected to said coiler plate means for displacement in unison therewith, and wherein said driving means are operable to gradually displace said coiler plate means from a starting position near said open end of said pan towards said base plate means in synchronism with the increase of height of a bundle or coil of wire rod produced in the operation of said coiler, and thereafter to return said coiler plate means to said starting position for ejecting said bundle or coil, said flexible elements being provided for contacting outer windings of said bundle or coil.

3,955,774

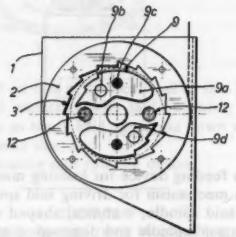
BELT WINDER FOR SAFETY BELTS

Per Olaf Weman, Haslah, Germany, assignor to Sigmatex, A.G., Basel, Switzerland

Filed Nov. 25, 1974, Ser. No. 526,769

Int. Cl.² B65H *75/48*

U.S. Cl. 242—107.4 A **6 Claims**



1. A belt winder for safety belts in vehicles, comprising a rotatable shaft mounted on a housing onto which is wound the end of the belt which can be drawn out of the winder, and further comprising a locking mechanism whereby the shaft is locked to prevent any more of the belt from being drawn out when a predetermined angular acceleration is exceeded, the locking mechanism comprising an inertia member rotatably mounted on the shaft, a locking member carried by the shaft by means of a pin and which can be moved into a locking position to engage an abutment member fixed to the housing through rotation of the inertia member relative to the shaft when there is rapid angular acceleration of the shaft, characterised in that the inertia member is in the form of a ring carrying at least one pin, and said inertia member including engagement means for a spring, the inertia member being coupled to the shaft by the spring, the locking member arranged between the inertia member and the shaft and having an edge for engaging the pin carried by said ring.

3,955,775

TEXTILE TREATMENT TUBE

Josef Egyptien, Aachen, and Walter Henning, Alsdorf-Begau, both of Germany, assignors to Messrs. Jos. Zimmermann, Aachen, Germany

Filed June 30, 1975, Ser. No. 591,698

Claims priority, application Germany, July 6, 1974, 7423096

Int. Cl.² B65H *75/28*

U.S. Cl. 242—125.1 **6 Claims**

1. A textile treatment tube or spool comprising an annular groove for holding a reserve of yarn the groove being disposed some distance from the lower edge of the tube; at least one yarn-holding arm between the groove and the said lower edge, the said arm being disposed on the outside of the tube; and a yarn-gripping channel adjacent the arm, characterised in that

the arm extends approximately longitudinally of the spool with its free end directed towards the lower edge of the spool, the

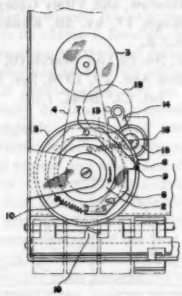
yarn-gripping channels being disposed immediately adjacent the yarn-holding arm.

3,955,776

AUTOMATIC STOP MECHANISM FOR TAPE RECORDER

Fumito Komatsu, Suwa, and Akihiko Isaka, Nagano, both of Japan, assignors to Sankyo Seiki Mfg. Co., Ltd., Tokyo, Japan

Filed July 2, 1974, Ser. No. 485,314
Claims priority, application Japan, July 5, 1973, 48-76402
Int. Cl.² B65H *59/38*; G03B *1/02*; G11B *15/32*
U.S. Cl. 242—191 **7 Claims**



1. Automatic stop mechanism for an electronic tape apparatus, comprising a driven rotor, sensing means mounted on said driven rotor in co-axial relation thereto, a reel disc on which a tape reel of a tape cassette can be mounted, said sensing means being in operative contact with said reel disc, operating means operating coupling said driven rotor and said sensing means and permitting relative angular rotation, said operating means including a projection, said operating means normally causing said sensing means to rotate with said driven rotor and, upon completion of a tape winding operation, a braking force due to the tensile force exerted from the tape is applied to the reel disc which in turn applies the braking force to said sensing means to produce relative angular rotation between said driven rotor and said sensing means, said projection of said operating means being projected out of said sensing means upon said relative angular rotation for operating an unlocking mechanism for a locking means keeping the tape-running condition.

3,955,777

SELF THREADING LEADER FOR A REEL OF TAPE

Donald L. Burdorf, Newport Beach, Calif., assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Aug. 16, 1974, Ser. No. 498,037
Int. Cl.² G11B *15/66*; B65H *75/28*
U.S. Cl. 242—192 **3 Claims**

1. A self-threading leader for use with a reel of recording tape, said leader comprising:

a first leader portion attached to an end of said recording tape and having a width greater than the width of said tape,

a second leader portion adjacent to said first leader portion having a means for gripping the edges of said first leader portion without engaging the edges of said recording tape,

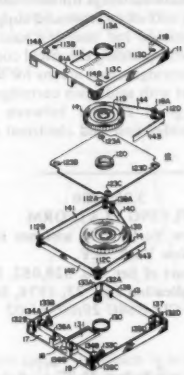
the combined length of said first and second leader portions being greater than the circumference of said reel of recording tape so that, when said leader is coiled about the outer circumference of said reel, the gripping means of said second leader portion will engage the edges of said first leader portion thereby maintaining the integrity of said reel.

3,955,778

TAPE CASSETTE

Shui Ting Lu, No. 28-3, Hsin Sheng South Road, Sec. 3, Taipei, China

Filed June 24, 1974, Ser. No. 482,135
Int. Cl.² G03B *1/04*; G11B *15/32*
U.S. Cl. 242—194 **8 Claims**



1. A cassette comprising upper and lower casing parts adapted to be secured together to provide an internal space, means mounting a fixed partition within said space for defining separate upper and lower chambers, means rotatably mounting a reel within each chamber, said reels being coaxial, means for transporting and guiding a web from one of said reels within the cassette through a station at one edge of the casing where the web is exposed to external web utilization means and back within the cassette to the other reel comprising a series of inclined surface rollers within said space, means

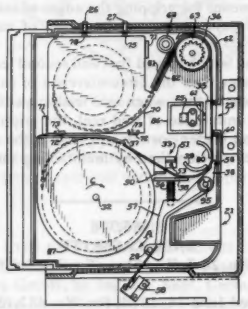
at said station for orienting the web with respect to said utilization means, and at least one cylindrical roller parallel to the reel axis disposed adjacent each reel and located between said each reel and an inclined roller for directing the web tangentially to or from the reel, said partition having dimensions which are generally coextensive with the length and breadth of said cassette except at said station and said partition further being spaced at its edges from said casing parts to permit travel of said web from one chamber to the other, and means providing an opening in at least one of said casing parts for admitting drive means for said reels.

3,955,779

CARTRIDGE WITH REMOVABLE TAKE-UP SUB-CARTRIDGE

Paul G. Bielik, North Riverside, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed May 28, 1974, Ser. No. 473,640
Int. Cl.² G03B *1/04*; G11B *15/32*, *23/04*
U.S. Cl. 242—199 **11 Claims**



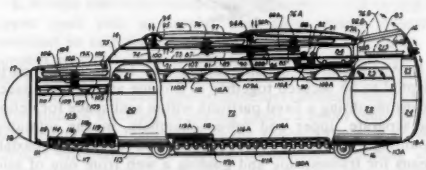
1. A main cartridge for a web, said main cartridge comprising a supply reel, removable sub-cartridge take-up means, and guide means in said main cartridge for automatically threading said web from a path extending from said supply reel and into said sub-cartridge, means for inserting said web into said sub-cartridge, and corresponding electrical contacts in each of said main and sub-cartridges, and means for biasing said sub-cartridge into contact with said main cartridge with sufficient pressure to make good contact between said electrical contacts in said cartridge and said electrical contacts in said sub-cartridge.

3,955,780

FLYING PLATFORM

Steven Postelson, New York, N.Y., assignor to Steven Postelson-Apostolescu, New York, N.Y.

Continuation-in-part of Ser. No. 329,052, Feb. 2, 1973, abandoned. This application Dec. 23, 1974, Ser. No. 535,278
Int. Cl.² B64C *29/00*, *15/02*
U.S. Cl. 244—12 B **5 Claims**



1. An aircraft comprising:

a. an elongated aircraft body formed with an intake port and a discharge port and defining therein a conduit connecting said ports;

b. blade means mounted in said conduit and including turbine blades and fan blades connected for joint rotation, said fan blades when rotating drawing a stream of external air into said intake port and ejecting said stream from said discharge port;

c. adjustable baffle means for controlling the direction of flow of said stream;

d. gas thrust means for thrusting a gas against said turbine blades and for thereby rotating said blade means; and

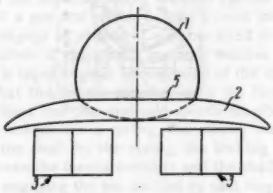
e. wing means on two, opposite, longitudinal sides of said body, each wing means including a first wing part fixedly mounted on said body, a pivotally mounted second wing part telescopically movable into and out of said first part, an elevator member movably mounted on said second wing part, first operating means on said first wing part for telescopically moving said second wing part, and second operating means on said first wing part for moving said elevator member relative to said second wing part, said second operating means including respective shafts on said first and second wing parts, and motion transmitting means connecting said shafts for joint rotation.

3,955,781

SUPERSONIC AIRCRAFT WITH THE ENGINES DISPOSED UNDER THE DELTA WING MIDDLE PORTION

Andrei Nikolaevich Tupolev, Leninsky prospekt, 14; Alexei Andreevich Tupolev, ulitsa Stanislavskogo, 15, kv. 25; Iosif Fomich Nezval, ulitsa Chkalova, 25, kv. 32; Georgy Alexeevich Cheremukhin, Krasnokazarmennaya, 9, kv. 174; Alexandr Emmanuilovich Sterlin, ulitsa K. Marxa, 20, kv. 266; Valentin Ivanovich Bliznjuk, ulitsa II Parkovaya, 37, korpus 3, kv. 46, all of Moscow; Alexandr Leonidovich Pukhov, ulitsa Gagarina, 35, kv. 47, Zhukovsky Moskovskio oblasti; Georgy Petrovich Svischev, ulitsa Kirova, 40-a, kv. 26; Georgy Sergeevich Bjushgens, ulitsa Suvorovskaya, 1/2, kv. 26, both of Moscow, and Vitaly Georgievich Mikeladze, ulitsa Mayakovskogo, 17, kv. 20, Khukovsky Moskovskoi oblasti, all of U.S.S.R.

Continuation of Ser. No. 18,166, March 10, 1974, abandoned. This application Apr. 29, 1974, Ser. No. 471,713
Int. Cl.² B64C *1/00*
U.S. Cl. 244—13 **2 Claims**



1. A supersonic aircraft comprising a fuselage having a front end, a base line, a fin portion and a nose portion, said nose portion having a front boundary and a rear boundary, the contour of the cross-section of the nose portion, except for the front end of the fuselage being defined by two circles of different radii, the circles being disposed one above the other, the radius of the lower circle being 1.3 to 1.7 greater than the radius of the upper circle, a cabin floor at the level of the intersection of the two circles serving as a boundary between the circles, the width of the cross-section exceeding the height whereby the bearing characteristics of the fuselage are improved and the aerodynamic center of the aircraft is shifted insignificantly when switching from subsonic speed to supersonic speed, a delta wing disposed in the middle portion of the fuselage, the wing having a front edge, engines under the middle portion of the wing, the intersection of the two circles gradually passing to the front edge of the wing at the sides of

the nose portion of the fuselage to provide for uniform conditions of vortex formation, raise the bearing characteristics of the wing and the longitudinal and directional stability, the small limit referring to the front boundary of the nose portion and the greater limit to the rear boundary of the nose portion, and the longitudinal axis of the section of the nose portion of the fuselage at its front end and including the front end being inclined downwardly relative to the base line of the fuselage at an angle of 4° – 6° to increase the pilot's field of vision.

3,955,782

TURBINE ENGINES

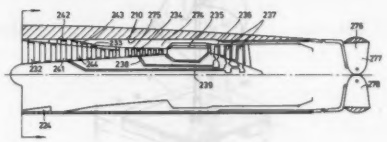
Peter Henry Calder, and Neil Milner Evans, both of Bristol, England, assignors to Rolls-Royce (1971) Limited, London, England

Filed July 10, 1974, Ser. No. 487,025

Claims priority, application United Kingdom, July 11, 1973, 32959/73

Int. Cl.² B64D 27/16

U.S. Cl. 244—53 R **2 Claims**



1. A jet propulsion powerplant comprising a gas turbine two-spool turbojet engine, a first compressor of the gas turbine turbojet engine, said first compressor being the low-pressure compressor of said engine and having a plurality of stages which successively decrease in diameter in the direction of flow, a casing for the engine having a substantially circular cross-section, a nacelle shaped for supersonic flight speeds in which the engine in its casing is located, the nacelle having a substantially square cross-section and defining with the casing a duct which thereby has an exterior periphery which is substantially square in cross-section and an interior periphery which is substantially circular in cross-section, the nacelle having an inlet capable of receiving ambient air at flight speeds up to supersonic speeds and being arranged for supplying air to both said engine and said duct, characterized by an auxiliary axial flow compressor arranged to compress air passing along said duct, each rotor blade stage of said auxiliary compressor being arranged to be concentric with and driven by a respective upstream stage of the first compressor of the turbojet engine such that the outer diameter of each rotor blade stage substantially does not exceed the diameter of the largest first compressor stage, and an auxiliary casing for the auxiliary compressor communicating with said duct, said auxiliary casing having substantially the same diameter as the largest diameter of the gas turbine turbojet engine casing.

3,955,783

HYDRAULIC ACTUATING ARRANGEMENT FOR AIRCRAFT CONTROL SURFACES

Stanley George Glaze, Brierley Hill, and John Richard Simmons, Wolverhampton, both of England, assignors to Joseph Lucas (Industries) Limited, Birmingham, England

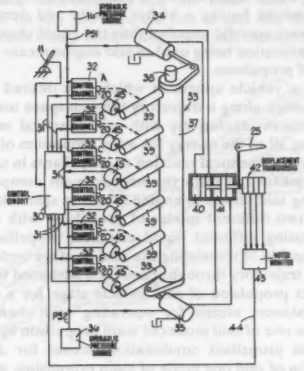
Filed Dec. 4, 1974, Ser. No. 529,517

Claims priority, application United Kingdom, Dec. 7, 1973, 56952/73

Int. Cl.² B64C 13/40

U.S. Cl. 244—85 **7 Claims**

1. A hydraulic actuating arrangement for an aircraft control surface, comprising an electrical control circuit responsive to a position selection first input signal to provide six nominally identical electrical control signals, six pilot valves respectively responsive to said electrical control signals to provide respective servo pressure signals, six intermediate actuator devices responsive to respective ones of said servo pressure signals, two main control valves, a resilient mechanical coupling device interconnecting said intermediate actuators and said control valves, means for supplying first and sceond hydraulic pressures, a first three of said pilot valves and one of said main control valves being connected to one of said hydraulic



supplies and a second three of said pilot valves and the other of said main control valves being connected to the other of said hydraulic pressures, and an output actuator responsive to the pressures from said main control valves, said output actuator being connected, in use, to vary the position of a control surface on an aircraft.

3,955,784

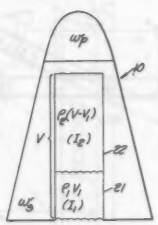
MIXED MODE PROPULSION AEROSPACE VEHICLES

Robert J. Salkeld, Malibu, Calif. 90017

Continuation of Ser. No. 227,827, Feb. 22, 1972, abandoned, which is a continuation-in-part of Ser. No. 38,793, May 19, 1970, abandoned, which is a continuation-in-part of Ser. No. 847,094, Aug. 4, 1969, abandoned. This application Mar. 18, 1974, Ser. No. 451,810

Int. Cl.² B64G 1/20

U.S. Cl. 244—172 **12 Claims**



1. In a vehicle system in which it is desired to propel a vehicle stage along a trajectory through space using chemical engine means exlusively with said chemical engine means obtaining energy for main propulsion of said vehicle stage from a chemical reaction of propellants in said chemical engine means, wherein the improvement comprises, the steps of using said chemical engine means exclusively to provide two modes of main propulsion of said vehicle stage with each of said modes using different liquid chemical propellant combinations each capable of translating the vehicle stage center of gravity along a trajectory through space for a sustained long time duration to effect said main propulsion of said vehicle stage for a substantially long distance; operating said chemical engine means in a first one of said modes of main propulsion

in said vehicle stage to propel the vehicle stage by a first liquid chemical propellant combination; discontinuing operation of said one mode of main propulsion; then operating the other mode of main propulsion in said vehicle stage to propel the same by a second liquid chemical propellant combination, said first mode of main propulsion further including the step of using a first liquid chemical propellant combination in said engine means having a higher density and density-impulse, and a lower specific impulse, than the liquid chemical propellant combination being used in said engine means in said other mode of propulsion.

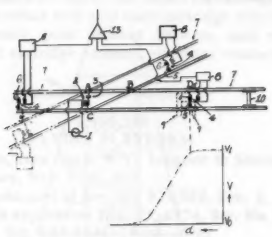
7. In a vehicle system in which it is desired to propel a vehicle stage along a trajectory through space using chemical engine means exclusively with said chemical engine means obtaining all of the energy for main propulsion of said vehicle stage from a chemical reaction of propellants in said chemical engine means, wherein the improvement comprises, means including said chemical engine means in said vehicle for producing two different modes of propulsion with each of said modes using different liquid chemical propellant combinations capable of translating the vehicle stage center of gravity along a trajectory through space for a sustained time duration to effect propulsion of said vehicle stage for a substantially long distance; means for operating said chemical engine means in one of said modes of main propulsion by a first liquid chemical propellant combination; means for discontinuing operation of said one mode of main propulsion; said chemical engine means including means for operating in the other mode of main propulsion by a second liquid chemical propellant combination after discontinuance of operation of said one mode of main propulsion, the liquid chemical propellant combination used in said one mode of main propulsion having a higher density and density-impulse, and a lower specific impulse, than the second propellant combination.

3,955,785

ELECTRICAL PROTECTIVE CIRCUITS

Dirk J. Vermeulen, 86 Hamilton Ave., Craighall Park, Johannesburg, South Africa, and Ernest J. Moorey, 148 Cleeve Drive, Ivy Bridge, Devon, England

Continuation-in-part of Ser. No. 331,005, Feb. 9, 1973, abandoned. This application Oct. 7, 1974, Ser. No. 512,933
Int. Cl.² B61L *23/16*
U.S. Cl. 246—34 CT **5 Claims**



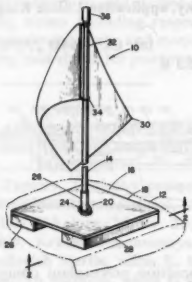
1. A detective circuit for railway points composed of three track sections connected together at a junction or for a railway crossing composed of four track sections connected together at a junction, said circuit comprising ac generator means for supplying energy at a selected frequency across the junction of the points or crossing, a first capacitor connected across the junction to form a resonant circuit at the said frequency with the inductance of the lengths of track between the junction and the intersection or intersections of the tracks, said tuned circuit comprising $C + L_{AB} + L_{BC}$, wherein C is the capacitance of said capacitor and L_{AB} and L_{BC} are the inductances of two of said lengths of track, a low impedance, frequency selective link connected across the tracks of each section of the points or crossing, each link comprising a second capacitor forming a tuned circuit at the said frequency with the inductance of an inductor connected in series therewith, and, means for monitoring the current or voltage in each link, the current or voltage in each link in the converging track sections of the points or crossing appearing as a result of the voltage arising in the aforesaid lengths of track during use of the detective circuit.

3,955,786

MINIATURE MAGNETIC BASE FLAGSTAFF ASSEMBLY FOR VEHICLE BODIES

James J. Duddy, 514 N. Metcalf St., Lima, Ohio 45801

Filed Feb. 19, 1975, Ser. No. 551,124
Int. Cl.² A01K *97/10*
U.S. Cl. 248—537 **4 Claims**



1. A miniature flagstaff assembly adapted to be detachably attached to an exterior surface of a ferromagnetic automobile body or a fender surface thereof for support thereby, said assembly comprising in combination, a planar base plate of predetermined geometric configuration to provide an appreciable area, a plurality of permanent bar-shaped magnet members of uniform thickness respectively connected in permanent adhesive affixment to one surface of said base plate in opposing parallel spaced relationship to each other respectively along opposite side edges of said base plate and substantially co-extensive in length therewith, a smooth circular centrally located opening formed in said base plate inwardly from all edges thereof, a threaded bolt extending perpendicularly upward through said opening from said one surface of said base plate and projecting substantially perpendicularly above the opposite planar surface of said base plate, a nut threaded downward onto said bolt in compressive communication with said opposite planar surface of said base plate to threadably secure said bolt in tight connection thereto and the outer end of said bolt being projective perpendicularly upward from said opposite planar surface of said base plate beyond said nut, a length of socket-forming tubing of limited flexibility having an inner tubular surface of uniform diameter throughout threaded part way at one end thereof onto said projecting end of said bolt and projecting perpendicularly upward from said opposite surface of said base plate and being in firm engagement with the upwardly disposed opposite side surface planar side of said nut, the other end of said tubing extending upward from the terminal end of said bolt to comprise a socket with the upwardly disposed terminal end of said bolt forming a base for said socket, a staff having limited flexibility and small diameter and having one end thereof tightly and frictionally fitting into said socket formed by said tubing so that the downwardly disposed terminal end of said staff is in close communication with said upwardly disposed terminal end of said bolt, the thickness of said magnets being at least as great as the depth of the head of the bolt clamped against said one surface of said base plate, and said magnets being formed from a non-abrasive elastomeric material of a pliable nature in which a mass of discrete permanently magnetized iron particles are uniformly distributed throughout said material to render the

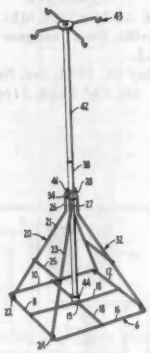
same magnetically attachable to a ferromagnetic automobile body or a fender surface thereof without scratching the finish thereon and thereby supporting said staff vertically upright of said automobile body or fender surface in stable manner and also permitting ready detachability of said flagstaff assembly therefrom.

3,955,787

DISPLAY STAND

George L. Brown, Benicia, Calif., assignor to Allied Products Company, Benicia, Calif.

Filed July 10, 1975, Ser. No. 594,637
Int. Cl.² A47F 5/10; F16M 11/38
U.S. Cl. 248—159 **2 Claims**



1. A pole holder or the like which is adapted to be shipped in collapsed form and easily erected comprising in combination:

a. a square base member formed of heavy wire,

b. a cross member consisting of two wires connecting substantially the center portions of each of the opposite sides of said square member and forming a right angle crossing at the center of the base member,

c. triangular members hingedly connected at their terminal ends to two of the opposite side members of said base member,

d. each of triangular members being formed of a stiff wire and having a curved interlocking horizontal center section,

e. spaced cross members located under said curved interlocking sections separated therefrom by a space about equal to the diameter of the wire used to form said triangular members, and

f. a central pole member passing between said curved interlocking sections and having a cross-grooved member at the bottom terminal end thereof, said grooved member snapping over said right angle crossing.

3,955,788

APPARATUS FOR POSITIONING AND SUPPORTING OPTICAL LABORATORY INSTRUMENTS

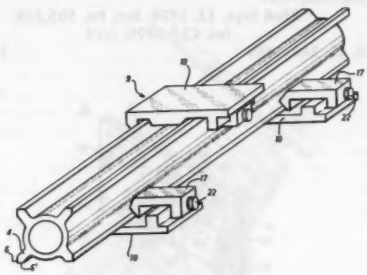
Jean Delage, 3, rue Paul Bert, 94400 Vitry-sur-Seine, France

Filed Jan. 24, 1975, Ser. No. 543,913
Claims priority, application France, Jan. 25, 1974, 74.02482
Int. Cl.² E01B 7/18
U.S. Cl. 248—228 **4 Claims**

1. A device for supporting and positioning relatively movable instruments such as optical apparatus used in laboratories, said device comprising:

a rail constituted by a linear tubular structure and comprising at least three radial fins projecting from said tubular structure, the ends of said fins being equidistant from one another;

a plurality of clamps, each clamp being constituted by a plate comprising a flat outer face adapted to fixedly receive said instruments, and an inner face slidably mounted on any two adjacent fins of said rail, the inner face of each clamp comprising a first side branch forming



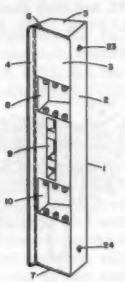
a groove whose section is substantially complementary to the section of a fin and receiving one of the two adjacent fins and, on the opposite side, a second side branch supporting a locking member having a surface adapted to abut in locking position the second fin, said groove and said locking member being situated at a distance from each other corresponding to the distance separating any two adjacent fins, thus permitting any clamp slidably to be mounted on any two of the radial fins.

3,955,789

TUBE HOLDER

Stephen J. Baumrind, Charleston, S.C., assignor to Larry Harold Kline, Charleston, S.C., a part interest

Division of Ser. No. 214,186, Dec. 30, 1971, Pat. No. 3,737,921. This application Nov. 16, 1972, Ser. No. 307,028
Int. Cl.² A47C 7/70; A61G 12/00; A47B 73/00
U.S. Cl. 248—311 A **4 Claims**



1. A device for holding a tube comprising holding means attached to a wall which allows access for squeezing said tube and access for receiving the contents of said tube when it has been squeezed and liquid removal means for liquid to flow out of said holding means, said liquid removal means comprising a bottom layer sloped downward from the back to the front of said device, thereby allowing any liquid which might enter said device to flow down said bottom layer and out of said device, wherein said liquid removal means further comprises a top layer sloped upward from the back to the front of said device, wherein said liquid removal means further comprises a top

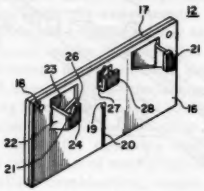
layer sloped upward from the back to the front of said device, whereby when said device is turned 180°, said top layer becomes the new bottom layer allowing any liquid which might enter said device to flow down said bottom layer and out of said device.

3,955,790

WALL HANGER DEVICE

Gene Ballin, Locust Valley, N.Y., assignor to Betty Ballin, Merrick, N.Y.

Filed Sept. 12, 1974, Ser. No. 505,329
Int. Cl.² A47G 1/16
U.S. Cl. 248—489 **12 Claims**



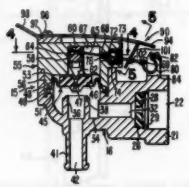
1. A hanger device comprising a mounting plate, laterally spaced support elements mounted on and positioned forwardly of said plate, and level indicating means located on said mounting plate for indicating the relationship of said support elements to the horizontal, said level indicating means comprising a plumb member suspended from said mounting plate, said mounting plate having indicia thereon registering with a predetermined section of said plumb member when said support elements are at a common level.

3,955,791

PILOT OPERATED FLUID CONTROL VALVE

Alan F. Meckstroth, 2357 Shelterwood Drive, Dayton, Ohio 45409

Continuation-in-part of Ser. No. 324,506, Jan. 17, 1973, Pat. No. 3,873,059. This application May 20, 1974, Ser. No. 471,290
The portion of the term of this patent subsequent to Mar. 25, 1992, has been disclaimed.
Int. Cl.² F16K 31/02; F03G 7/06
U.S. Cl. 251—11 **13 Claims**



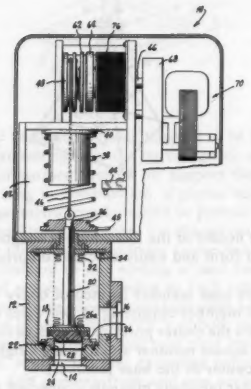
1. A pilot operated fluid control valve comprising a valve body including a base section and a closure section, said base section having an inlet and an outlet with a valve seat therebetween, a flexible diaphragm cooperating with said seat to control the flow of fluid from said inlet to said outlet and having means defining a bypass port, a movable valve member supported by said closure section for movement between an open position and a closed position relative to said port to control the movement of said diaphragm by differential pressure across said diaphragm, an elongated actuating lever, means including a flexible seal on said closure section of said valve body for supporting an intermediate portion of said lever for pivotal movement of said lever, means connecting the inner end portion of said lever to said valve member, a bimetallic actuating element supported entirely by said closure section of said valve body, means for heating said actuating element to effect movement of an actuating portion of said element between a normal position and a heated position, means for moving the outer end portion of said lever in response to movement of said actuating portion of said element between said normal and heated positions to effect movement of said valve member between said open and closed positions, said latter means including a spring connected to said lever and effective to cause relatively rapid movement of said lever and said valve member in response to slower movement of said actuating portion of said element, and said spring is supported entirely by said closure section of said valve body.

3,955,792

VALVE ACTUATOR MECHANISM

Nakwon Cho, Knoxville, Tenn., assignor to Electro-Nucleonics, Inc., Fairfield, N.J.

Filed May 15, 1975, Ser. No. 577,948
Int. Cl.² F16K 31/44
U.S. Cl. 251—69 **7 Claims**



1. An actuating mechanism for a movable valve member which is biased toward a first valve position comprising a cable adapted to be coupled at one portion thereof to said movable valve member, a drum upon which another portion of said cable is wound, drive means for selectively driving said drum to wind said cable thereon and to move said valve member to a second valve position, and control means for releasing said drum to permit said valve member to move under the action of said biasing to said first valve position.

3,955,793

VALVE STEM STATIC SEAL SYSTEM

Joseph A. Burkhardt, New Orleans, and Thomas W. Childers, Mandeville, both of La., assignors to Exxon Production Research Company, Houston, Tex.

Filed June 21, 1974, Ser. No. 481,731
Int. Cl.³ F16K 35/04
U.S. Cl. 251—95 **10 Claims**

1. A valve stem system for use with a subsea valve located in a flowline comprising:

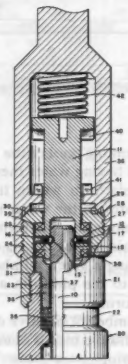
a valve stem attachable to said valve for opening and closing said valve upon rotation of said valve stem;

a valve bonnet mounted on said flowline and surrounding a section of said valve stem;

a cap member threadedly engagable with and removable from said valve bonnet; said cap member and said valve bonnet containing sealing surfaces adapted to mate and form a metal-to-metal seal therebetween when said cap member is threaded onto said valve bonnet;

another section of said valve stem extending into said cap member and being provided with a spline;

a spline clutch arranged on the interior of said cap adapted to engage said valve stem spline when said cap is removed from said valve bonnet;



biasing means for urging said spline clutch into engagement with said valve stem spline when said cap member is removed from said valve bonnet; and

bearing means surrounding said valve stem in said valve bonnet to permit rotation of said valve stem relative to said valve bonnet, rotation of said cap causing rotation of said valve stem when said cap member is removed from said valve bonnet.

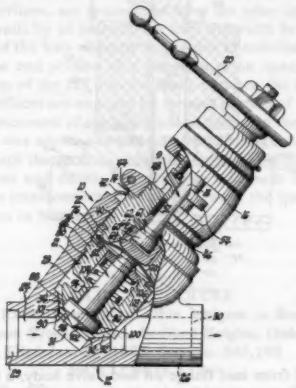
3,955,794

HERMETICALLY SEALED VALVE WITH FIXED DIFFUSER

Andrew Hankosky, Pittsburgh, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Feb. 20, 1975, Ser. No. 551,260
Int. Cl.² F16K *47/16*
U.S. Cl. 251—123 **3 Claims**

1. A hermetically sealed valve, comprising: a valve body having an inlet port for receiving high pressure fluid, an outlet port for delivering the fluid, a cylindrical control chamber communicating with the outlet port and having an axis intersection the axis of the inlet port, and a through passage coaxial with said control chamber fluidly interconnecting the inlet port with the control chamber; a frusto-conical diffuser surface coaxial with the control chamber and flaring outwardly from the passage thereto; a hardened valve seat at the intersection of said passage and said diffuser surface; a diffuser assembly fixedly mounted in said control chamber and having a head portion with an outwardly flaring frusto-conical surface in spaced relationship to said frusto-conical diffuser surface and defining therebetween an outwardly expanding low pressure drop annular diffuser passage, said head portion having a first counterbore in the lower surface thereof coaxial with the through passage in the control chamber and having a diameter slightly larger than said passage; a central opening in said diffuser assembly including an enlarged second counterbore at the upper portion thereof; and axially movable closure disc slidably supported on said diffuser assembly, said closure disc having a head section slidably received in the first counterbore and a stem projecting axially upwardly through said central opening in said diffuser assembly and including a terminal portion in said second counterbore, said closure disc having an annular peripheral seating portion slightly larger than said passage and adapted to sealingly engage said valve seat in a closed position, and further having a convex tip portion penetrating the passage in the closed position; spring means received in said second counterbore and operative to bias the closure disc to a retracted position opening the diffuser passage; a flexible diaphragm at the end of the chamber and hermetically sealing the latter; a valve stem engaging the upper portion of said diaphragm and operative against the diaphragm to shift the closure disc between an extended cloaed position and a retracted open position against the biasing of said spring means to thereby open and close said diffuser passage, the closure disc being exposed to essentially no hydrodynamic pressure differentials at the head section thereof which would produce forces thereon in a direction acting to close said closure disc.



3,955,795

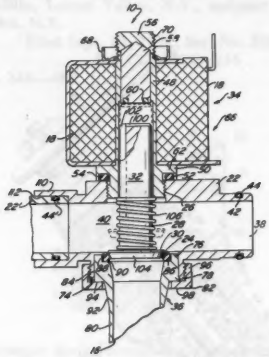
VALVE

Raymond J. Neely, Montgomeryville, Pa., assignor to Refreshment Machinery Incorporated, Warminster, Pa.

Filed Nov. 15, 1973, Ser. No. 415,878
Int. Cl.² F16K *31/02*
U.S. Cl. 251—129 **11 Claims**

1. A valve comprising a valve body having a flow passage means communicating with the interior thereof, said body including an annular wall having first and second apertures, a valve member having a valve stem, said valve member including a valve head for closing said first aperture, said stem being connected to said valve head and extending through said second aperture, means for moving the valve member toward and away from said first aperture, said last named means including a sleeve, one end of said sleeve being threadedly connected to said valve body at said second aperture, said valve stem extending into said sleeve and being axially movable therein, energizable means having first and second parts, a first part of said energizable means being disposed within said sleeve, the second part of said energizable means surrounding said sleeve, said energizable means being operative to displace said valve member away from said first aperture when energized to permit a fluid to flow from said valve body through said first aperture, spring means biasing said valve member towards said first aperture, means for threadingly retaining said second part of said energizable means on said sleeve so that said means for moving said valve member can be easily separated from said valve body and said second part

of said energizable means can be separated from said sleeve, an outwardly directed flange on said valve body surrounding said first aperture, a discharge spout, said discharge spout being telescopically received with said flange, a fastener interconnected between said flange and spout for releasably retaining said discharge spout in assembled relationship with said flange in a manner so that said discharge spout can be easily



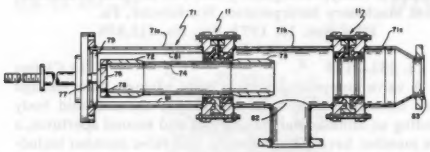
separated from said flange on said valve body, a sealing ring disposed between said valve body and discharge spout to provide a seal therebetween, said sealing ring having an exposed portion in said first aperture, said first aperture having transverse dimensions greater than the transverse dimensions of said valve head so that said valve head can extend therethrough for sealing contact with the exposed portion of said sealing ring.

3,955,796

FLOW CONTROL APPARATUS

Marvin H. Grove, Houston, Tex., assignor to M & J Valve Company, Houston, Tex.

Filed Feb. 12, 1975, Ser. No. 549,181
Int. Cl.² F16K 3/24
U.S. Cl. 251—172 **6 Claims**



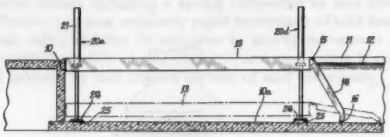
1. In flow control apparatus, a hollow body having spaced openings forming flow passages and spaces within the body communicating with the openings, the body having two sections joined between the spaces, an annular sealing assembly disposed between the body sections, closure means within the body adapted to cooperate with the sealing assembly, the closure means including a closure member having a cylindrical outer surface, and means serving to carry the closure for reciprocation into and out of sealing relationship with the annular sealing assembly to shut off or permit fluid flow between the flow passages, the sealing assembly comprising oppositely faced cup-shaped annular members of resilient material, each member including a base portion and a rim portion on the inner periphery of the base portion, the inner diameter of each rim portion when relaxed being less than the diameter of the closure, said assembly serving to couple the two body sections together.

3,955,797

SWIMMING POOL LIFT

Lawrence I. Richards, Elk Grove Village, Ill., assignor to Autoquip Corporation, Chicago, Ill.

Filed Jan. 24, 1974, Ser. No. 436,035
Int. Cl.² E04H 3/19
U.S. Cl. 254—89 H **9 Claims**



1. In a lift for a swimming pool or the like comprising a body defining the pool and having water therein, said lift including a vertically moving platform within the pool which can be raised and lowered through the water in the pool, and power means to vertically move the platform in the pool, the improvement wherein said power means comprises:

a plurality comprising a given number of spaced hydraulic rams connected to the platform and body for vertically moving the platform,

a corresponding number of positive displacement hydraulic motors, each hydraulic motor comprising a cylinder having a piston therein,

conduit means connecting each respective motor with a respective ram so that each ram is actuated by a respective motor,

motor actuating means connected to said hydraulic motors to actuate the same in unison,

said rams, said motors and said conduit means forming a hydraulic system,

hydraulic fluid in the hydraulic system, said hydraulic fluid being water compatible with the water in the pool, and

means connected to said hydraulic system for automatically supplying make-up water to said system to replace loss of water therein,

said make-up water supply means comprising water supply conduit means connected to the piston end of each cylinder so as to be in fluid communication with the system through the interior of the cylinder only when the piston is withdrawn from the cylinder to its maximum extent, and water supply means connected to said water supply conduit means,

said hydraulic rams being so connected to said platform and body that the platform is raised when the ram is extended and the platform is lowered when the ram is retracted.

3,955,798

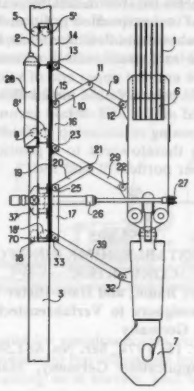
GUIDING AND POSITIONING DEVICE FOR THE BLOCK AND HOOK OF A DERRICK ON A SHIP

Andre Meyer, Chatenay-Malabry, France, assignor to Groupement pour les Activities Atomiques et Avancees "GAAA", Le Plessis-Robinson, France

Continuation-in-part of Ser. No. 256,899, May 25, 1972, abandoned. This application Nov. 28, 1973, Ser. No. 419,838
Int. Cl. B66c 23/60
U.S. Cl. 254—139 **3 Claims**

1. A guiding and positioning device for the tackle-block of a ship board derrick comprising a pair of spaced parallel guide rails secured to said derrick parallel to and offset from the axis of said derrick, carriage means mounted for movement along said rails, articulated connecting means secured to said carriage means and said tackle-block for permitting displacement of said tackle-block relative to said carriage with a single degree of freedom in a direction perpendicular to said rails

without movement of said carriage means and jack means connected perpendicularly at opposite ends to said carriage



means and said tackle-block respectively for moving said tackle-block toward and away from said carriage means.

3,955,799

PROTECTIVE RAILING DEVICE

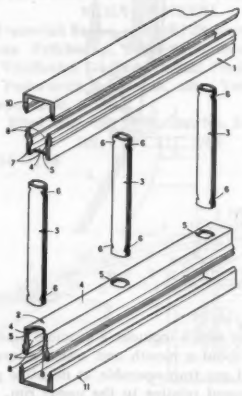
Rene Lauzier, Ruy, France, assignor to Cegedur GP, Paris, France

Continuation of Ser. No. 220,033, Jan. 24, 1972, abandoned. This application Oct. 11, 1974, Ser. No. 514,273

Claims priority, application France, Nov. 16, 1971, 71.40971

Int. Cl.² B21F *27/00*

U.S. Cl. 256—21 **9 Claims**



1. A railing device comprising a plurality of support bars having opposite side walls and a groove in each side wall spaced from the ends of the bars, said grooves having a portion in the direction of the adjacent end which extends inwardly substantially perpendicularly from the side wall and a contiguous portion which extends from the inner end of the groove outwardly to the side wall, and a pair of elongate rail members in spaced parallel relation having a base portion with a plurality of longitudinally spaced openings dimensioned to enable passage of the end portion of the bars therethrough, and side walls extending integrally substantially perpendicularly from the lateral edges of the base portion and spaced one from the other by an amount slightly greater than the width between the side walls of the bars with the side walls of one rail member extending in the direction away from the side walls of the other rail member so that the rail members define U-shaped members with oppositely facing concavities, the adjacent inner surfaces of the side walls, in at least the portions aligned with the openings, having a portion spaced from the base portion which tapers inwardly in the direction towards the opposite side wall to provide cam surfaces which terminate in a ridge which extends outwardly substantially perpendicularly to the side walls and which, at least at their terminal portions, are spaced one from the other in the adjacent side walls by an amount less than the width between the side walls of the bars whereby responsive to endwise displacement of the end portion of a bar through an opening in the base portion of the rail into the space between the side walls, the cam surfaces are engaged by the end portion of the bar to cause displacement of the side walls of the rail in the direction away from one another to increase the spaced relation therebetween until the grooves clear the terminal portions of the cam surfaces and enable return of the side walls thereby to establish an interconnected relation between the spaced walls and the bars in between.

3,955,800

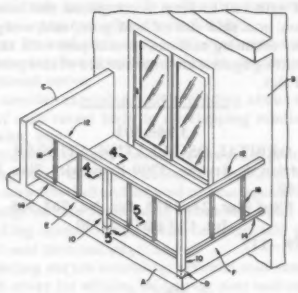
RAILING STRUCTURE

Adolph D. Russo, Beachwood, Ohio, assignor to Russo Ornamental Iron Products, Inc., Bedford Heights, Ohio

Filed Jan. 29, 1975, Ser. No. 545,193

Int. Cl.² B01F *13/00*

U.S. Cl. 256—59 **18 Claims**

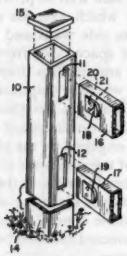


1. A railing construction comprising, at least one vertical post and a top railing, said post being tubular and having an inner surface and an upper end, a fastener receiving member supported within said post at said upper end, said fastener receiving member including a polygonal opening spaced radially inwardly of said inner surface and having a vertical axis, said top railing including horizontal plate means, said plate means including a horizontally planar plate portion extending across said upper end of said post and in overlying engagement therewith, said planar plate portion having a polygonal opening therethrough in alignment with said opening in said fastener receiving member, and expandable fastener means extending through said opening in said plate portion and into said opening in said fastener receiving member to interconnect said top railing and post, said fastener means having a polygonal portion disposed in each of said openings and of complementary cross-sectional configuration and size with respect to the corresponding opening.

3,955,801
PRE-FABRICATED FENCES

William Anthony Soriero, Jr., Hollywood, Fla., assignor to Vinylife Industries, Hollywood, Fla.

Filed Aug. 1, 1975, Ser. No. 601,139
Int. Cl.² E04H 17/14
U.S. Cl. 256—65 10 Claims

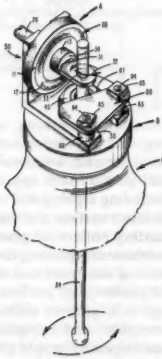


1. A prefabricated fence assembly, comprising:
a. a post member relatively a longitudinal tubular cylinder having a slot along one surface thereof, said slot communicating with the internal hollow of said cylinder,
b. a rail member having a cross sectional configuration relatively congruent with said slot in said post member, said rail member having at least one aperture in a side surface thereof near a front end of said rail,
c. a clip member of a wedge shaped side configuration tapering from a narrow front end to a thicker second end, said clip member having an accommodating projection on a bottom surface thereof for insertion into said aperture of said rail to form a composite rail assembly for insertion into said slot of said post, said wedge shaped member retaining said rail in said post with said thicker end abutting against an inner surface of said post adjacent to said slot.

3,955,802
ORBITAL OSCILLATING STIRRER

Norman Adrian de Bruyne, 3700 Brunswick Pike, Princeton, N.J. 08540

Filed Mar. 24, 1975, Ser. No. 561,346
Int. Cl.² B01F 11/00
U.S. Cl. 259—117 9 Claims

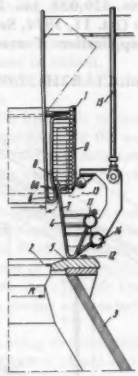


1. An orbital oscillating stirrer for fluids comprising first support means, air pressurizable means adapted to flex outwardly and inwardly under a single phase cyclic flow of ACA pressures and positioned on a first part of said first support means, means on said pressurizable means to receive and conduct said cyclic flow of ACA pressures thereto, flexible means positioned on a second part of said support means at right angles to said pressurizable means to sealingly receive and hold a stirring rod in a suspended position with a portion of said rod extending above said flexible means, linking means secured at one end to said pressurizable means and encompassing at the opposite end the upper end of said rod to move said upper end as said pressurizable means flexes, and camming means positioned on the end of said second part of said support means in opposing relationship to said pressurizable means and extending theretowards to a position selectively spaced from said upper portion of said rod.

3,955,803
VERTICALLY ADJUSTABLE DOME RING FOR OXYGEN CONVERTER

Kurt Baum; Jörg Peter Baum, and Hans-Dieter Weigelt, all of Essen, Germany, assignors to Verfahrenstechnik Dr. Ing. Kurt Baum, Essen, Germany

Filed Mar. 15, 1974, Ser. No. 451,508
Claims priority, application Germany, Mar. 29, 1973, 7311898[U]
Int. Cl.² C21C 5/38
U.S. Cl. 266—158 5 Claims



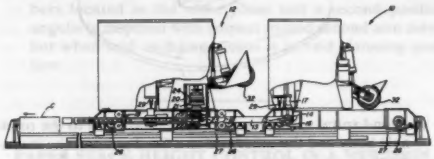
1. A converter which includes a crucible having an upper rim organized about a mouth and which converter further includes a fixed gas trap operable at negative pressure and spacedly juxtaposed relative to the upper rim, the gas trap having a dome with a dome opening which opening substantially conforms in cross section with the mouth and is adapted to receive gases therefrom, a vertically adjustable water cooled dome ring between the dome and the upper rim, the dome ring having a seating collar adapted to engage the upper rim in substantially gas tight manner; the converter characterized by:
the upper rim of the crucible provided with a downwardly and inwardly inclined lip,
the seating collar adapted to engage the upper rim about the mouth outward of and in close proximity of the inclined lip.

3,955,804

ADJUSTABLE APPARATUS FOR CUTTING A CONTINUOUSLY-FORMED CASTING INTO SHORT-LENGTH SEGMENTS

Francis Gallucci, North Huntingdon Township, Westmoreland County, and Frank Slamar, Monroeville Borough, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Dec. 23, 1971, Ser. No. 211,487
Int. Cl.² B23K 7/10
U.S. Cl. 266—50 6 Claims



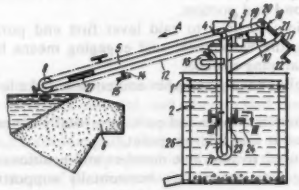
1. Apparatus for simultaneously cutting a plurality of segments of a measured but adjustable length from a continuously-formed casting as it travels, said apparatus comprising a plurality of carriages, means coupling said carriages together in spaced-apart relation, cutting means on each of said carriages and being spaced apart a distance equal to the length of one segment, said coupling means being adjustable to vary the spacing between said cutting means and thereby adjust the segment length, releasable clamping means carried by at least one of said carriages for engaging the casting, whereby both carriages travel with the casting when the clamping means is engaged therewith, and measuring means carried by at least one of said carriages for measuring a length of casting equal to the combined length of a corresponding plurality of segments, whereby said apparatus cuts a plurality of segments from the casting with each operation.

3,955,805

DEVICE FOR REMOVAL OF SLAG FROM SURFACE OF MOLTEN METAL

Alexandr Ivanovich Sapko, prospekt Zhdanova, 4, kv. 12; Dina Fedorovna Prikhodko, ulitsa Tregubenko, 10, kv. 41; Evgeny Vasilievich Godetsky, ulitsa Timiryazeva, 359, and Anatoly Fedorovich Borisevich, ulitsa Yatsenko, 16, kv. 70, all of Zaporozhie, U.S.S.R.

Filed Mar. 28, 1975, Ser. No. 563,204
Int. Cl.² C21C 7/04
U.S. Cl. 266—228 4 Claims



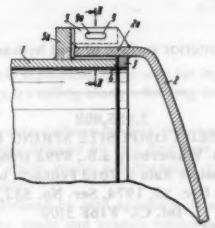
1. A device for the removal of slag from the surface of molten metal in a furnace, comprising: a slag-collecting vessel filled with a coolant; a frame made up of two parts articulated with, disposed at an angle to one another and adapted one to be introduced into said furnace and the other to be submerged in said vessel; an endless chain encompassing links and rollers secured on said frame; plate-like parts brought into contact with the slag, turned with their end faces to one another and disposed in succession on the external side of said links; a drive linked mechanically with said endless chain and adapted to carry it along said frame; knives mounted on said other frame part, facing each other with their blades and spaced at a distance approximating the thickness of said plate-like parts passing therebetween; and a gear for turning said one frame part about the horizontal axis of the articulation that connects said frame parts.

3,955,806

VESSEL WITH REFRACTORY LINING AND COVER ASSEMBLY THEREFOR

Karl Westerhuis, Orsoy, and Gunther Hahn, Duisburg, both of Germany, assignors to Demag Aktiengesellschaft, Duisburg, Germany

Filed May 29, 1975, Ser. No. 581,748
Claims priority, application Germany, May 31, 1974, 2426358
Int. Cl.² F27D 15/00
U.S. Cl. 266—275 7 Claims



1. A generally cylindrical vessel having a refractory lining and particularly suitable for shipping liquid metals comprising:
a vessel body having a side wall with a terminal edge defining an open end of said vessel body;
a cover for said open end, said cover comprising:
a cross-sectional configuration in the shape of a compound curve,
an annular extension wall extending about said side wall of said vessel body in overlapping relationship therewith, and
a circumferentially extending inwardly protruding packing strip arranged about the inside of said annular extension wall and located to bear against said terminal edge of said vessel body about said open end thereof;
a packing member interposed between said packing strip and said terminal edge; and
connecting means extending between said vessel body and said cover for affixing said cover over said open end, said connecting means including fastening wedges and receiving means having said fastening wedges introduced therein with said wedges arranged to extend tangentially of said vessel body when within said receiving means.

3,955,807

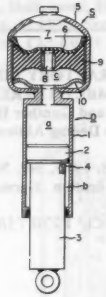
SUSPENSION DEVICE FOR A VEHICLE

Noriyuki Takahashi, Tokyo; Hidehiko Inoue, Saitama, and Hiromitsu Miyahara, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 29, 1975, Ser. No. 581,927
Int. Cl.² F16F 3/07
U.S. Cl. 267—65 B 3 Claims

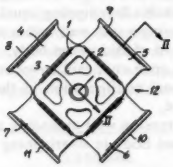
1. A suspension device for a vehicle including a hydraulic shock absorber, a spring unit defining therein by means of an elastic diaphragm, on opposite sides of the latter, a pneumatic spring chamber adapted to be filled with compressed air or gas and a hydraulic fluid chamber in communication with the interior of said shock absorber, characterized by spring means arranged within said hydraulic fluid chamber for resisting inflation of said pneumatic spring chamber under low load conditions of the device, wherein said spring means is of

elastic rubber and has a fluid passage formed therein, said elastic rubber being arranged adjacent said diaphragm and



adhering to the interior surface of said hydraulic fluid chamber.

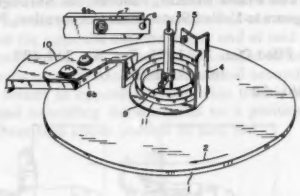
3,955,808
PRESTRESSED COMPOSITE SPRING ELEMENT
Raoul Jorn, Gem. Wasserburg a.B., 8992 Hengnau, and Peter Reichardt, Grasiger Rain 4, 7012 Feilbach, both of Germany
Filed Dec. 13, 1974, Ser. No. 532,374
Int. Cl.² F16F *3/09*
U.S. Cl. 267—152 **9 Claims**



1. A spring element for suspending an engine in an automotive vehicle, said spring element comprising:
a rigid metallic core having four outwardly directed faces;
a rigid metallic casing having a peripherally closed through-going central passage receiving said core and formed with four inwardly directed faces each spaced from and aligned with a respective face of said core; and
four substantially separate precompressed elastomeric bodies each having one side bonded to a respective face of said core and an opposite side carrying and bonded to a respective metallic plate pressing against and only frictionally engaging the corresponding face of said casing, said core, said bodies, and said plates constituting an integral insert which is symmetrical about a vertical plane and said passage extending generally horizontally such that said core has a pair of lower faces, the compression of said bodies being maintained in all relative positions of said casing and said core.

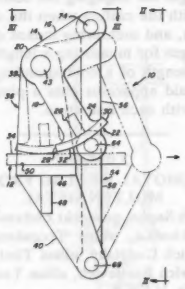
3,955,809
SPIRAL SPRING FOR INSTRUMENTS
Kuniyoshi Hara, and Junichi Honda, both of Kobe, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed May 23, 1974, Ser. No. 472,843
Int. Cl.² F16F *1/12*
U.S. Cl. 267—156 **13 Claims**

1. In an instrument having a movable part, a spiral spring arrangement comprising:
a rotatably supported rotatable body;
a first spiral spring having one end fastened to the rotatable body and the other end fastened to the movable part of the instrument; and



a second spiral spring having one end fastened to the rotatable body and the other end to a fixed point of the instrument.

3,955,810
CLAMPING APPARATUS
Jimmy K. Travis, 572 Douglas Drive, Circleville, Ohio 43113
Filed July 12, 1974, Ser. No. 487,965
Int. Cl.² B25B *5/04*
U.S. Cl. 269—238 **8 Claims**



1. Apparatus for clamping a workpiece comprising,
a lever having a first end portion and a second end portion,
a fulcrum point provided on said lever between said first and second end portion,
means rigidly secured to said lever first end portion for engaging the workpiece, said engaging means having a lower clamping surface,
a link member having an upper end portion and a lower end portion,
said link member upper end portion pivotally connected to said lever at said fulcrum point,
means secured to said link member and positioned below said engaging means for horizontally supporting the workpiece,
said lever arranged to pivot relative to said link member about said fulcrum point and move said engaging means into and out of clamping position with said workpiece supporting means, and
actuating means pivotally connected to said lever second end portion and said link member lower end portion for moving said engaging means clamping surface into and out of clamping position with said workpiece supporting means to thereby exert upon the workpiece of clamping force of a magnitude substantially greater than the force applied to said actuating means,
said actuating means including,

a first arm member having an upper end portion pivotally connected to said lever second end portion and a lower end portion,

a second arm member having an upper end portion pivotally connected to said first arm member lower end portion, and

said second arm member having a lower end portion pivotally connected to said link member lower end portion

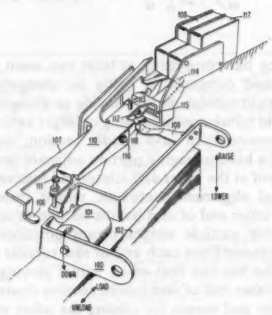
said first arm member arranged to assume a first position in vertical alignment with said second arm member with three pivotal connections associated with said arm members located in the same plane and a second position angularly disposed with respect to said second arm member when said engaging means is in said clamping position.

3,955,811

PAPER STACK HEIGHT CONTROL IN A MULTIBIN COPIER

David K. Gibson, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 3, 1975, Ser. No. 555,018
Int. Cl.² B65H *1/18, 3/44*
U.S. Cl. 271—9 **9 Claims**



1. In a copying apparatus wherein visual images are transferred to sheets of material, and wherein said sheets are selectively supplied from one of a number of sheet supply sources to a sheet transport path, each such source comprising:

an elevator assembly operable to control the position of the top sheet of the sheet stack thereon;

motive means connected to move said elevator assembly;

first sensing means cooperating with the top sheet of said stack when the stack is selected and operable to control said motive means so as to maintain the top sheet in operable relation to said sheet transport path;

control means operable to cause said motive means to lower said elevator assembly to a bottom position; and

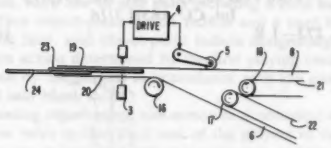
second sensing means cooperating with the top sheet of said stack when the stack is not selected and operable to control said motive means so as to maintan the top sheet at a position which is between said operable position and the position assumed when said elevator assembly is at said bottom position.

3,955,812

FLAT-ARTICLE SEPARATING APPARATUS FOR AN AUTOMATIC MAIL HANDLING SYSTEM AND THE LIKE

Kazuyoshi Suda; Tomoyuki Isono, and Seiichi Uematsu, all of Tokyo, Japan, assignors to Nippon Electric Company Limited, Tokyo, Japan

Filed Feb. 15, 1973, Ser. No. 332,843
Claims priority, application Japan, Feb. 17, 1972, 47-16623
Int. Cl.² B65H *29/60*
U.S. Cl. 271—64 **9 Claims**



1. A flat-article separating apparatus for separating overlapping flat articles travelling along a feeding route, said apparatus comprising:

a. a feeding route defined by first and second belts;

b. a main route defined by said first belt and a third belt, said main route being a substantial extension of said feeding route;

c. a branch defined by said second belt and a fourth belt, said feeding, main and branch routes being disposed on a common plane;

d. a branching section preceding said main and branch route in the direction of article travel and including at least one moving roller means for bending said first belt in said branching section; and

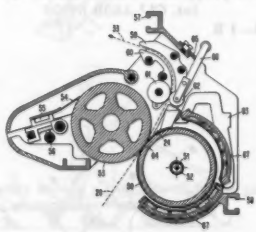
e. detector means disposed adjacent said feeding route upstream of said branching section and responsive to the passage of an article therethrough for activating said roller means after the leading edge of the article is moved between said first and third belts to thereby divert any overlapped article into said branch route.

3,955,813

COPY SHEET PEELER BAR HAVING FLUID JET ASSIST

Earl G. Edwards, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 7, 1975, Ser. No. 548,136
Int. Cl.² B65H *29/56*
U.S. Cl. 271—174 **5 Claims**



1. Apparatus for separating a copy sheet from the elongated fusing nip formed by a hot roll and a backup roll, comprising:

a peeler bar positioned adjacent said hot roll including a contoured edge spaced from said fusing nip, said edge comprising a central portion which is the closest to said nip, and two outboard edges which define a helix about said hot roll as they recede from said fusing nip; and

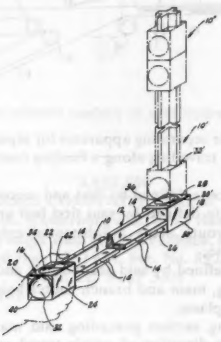
at least one fluid jet formed on the side of said peeler bar which faces said hot roll, said jet being located in the proximity of said central portion, said jet being oriented to direct fluid flow against the surface of said hot roll and substantially normal to said fusing nip.

3,955,814

BALANCING TOY WITH ENDS OF SOCKETS AND PROTRUSIONS

Lester G. Shallenberger, 1625 N. 8th St., Springfield, Ill. 62702

Filed Feb. 20, 1975, Ser. No. 551,073
Int. Cl.² A63H *3/16*
U.S. Cl. 273—1 R **10 Claims**



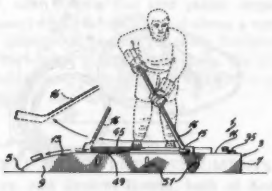
1. A balancing toy to be used in multiples comprising an elongated body and having first and second members at respective opposite ends, each said member having a plurality of surfaces said first member having one rounded socket in at least one of said surfaces and said second member having one rounded protrusion on at least one of said surfaces, said first member surfaces having only at least one socket and said second member surface having only at least one protrusion, and said toy being detachably receivable in another similar toy for the insertion of a protrusion of one toy into the socket of another similar toy.

3,955,815

HOCKEY TRAINING DEVICE

Gilles Deschesnes, 3243 6e rue Chomedy, Laval, Quebec, Canada

Filed Feb. 27, 1975, Ser. No. 553,842
Claims priority, application Canada, June 4, 1974, 201623
Int. Cl.² A63B *69/00*
U.S. Cl. 273—1 B **6 Claims**



1. A hockey training device comprising:

an elongated platform having an elevated top practicing wall formed with a through slot extending longitudinally thereon over the major portion thereof;

a pair of guide members, each provided on one side of said slot, parallel to said slot and to said practicing wall and means mounting said guide members beneath said practicing wall;

a carriage mounted beneath said practicing wall and having freely spinning wheels laterally mounted thereon and riding on said guide members;

a vertical post projecting from said carriage through said slot and above said practicing wall;

a puck secured at the top of said post to be hit by a player whereby said puck and carriage may be displaced from one end of said slot to the other;

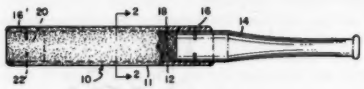
resilient return means including a spring loaded spool beneath said practicing wall behind said one end of said slot with respect to said other end and a cord fixed at one end to said carrier and wound on said spool at the other end when said carrier is at said one end of said slot, whereby when said puck is hit by a player, it is propelled with said carriage toward said other end of said slot until the momentum thereof is lost at which time the puck and carriage return to said one end under the action of said spring loaded spool.

3,955,816

WARM-UP BAT

Leonard R. Bratt, 84 Woodlawn St., Lynn, Mass. 01904

Filed Mar. 11, 1974, Ser. No. 449,737
Int. Cl.² A63B *59/00*
U.S. Cl. 273—26 B **7 Claims**



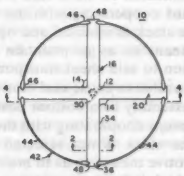
1. A practice bat comprising at least two main structural components, said components being an elongated handle section and a rigid tubular section having an elongated chamber therein; said tubular section being of larger external cross-sectional dimension than said handle section, said handle section having a hand engaging portion adjacent one end and a portion thereof at the other end telescoped into said tubular section in axial alignment therewith; means fastening said portion at the other end of said handle section in said tubular section; flowable particle weight means positioned in said chamber and spaced from each end of said tubular section to approximate the bat-like feel of an actual playing bat, said portion at the other end of said handle section closing one end of said chamber and means for closing the other end of said chamber.

3,955,817

TOY BOOMERANG

James E. Davis, Winter Park, Fla., assignor to Spiral Productions, Inc., Winter Garden, Fla.

Filed Aug. 23, 1973, Ser. No. 390,949
Int. Cl.² A63B *65/08*; A63H *27/12*
U.S. Cl. 273—106 D **1 Claim**



1. A boomerang comprising:

a hub region;

four elongated wing members extending outward from said hub region and being angularly spaced 90° apart in the same general plane, each comprising:

an upper convex surface and lower concave surface formed between leading and trailing edges, the combination of said surfaces providing lift and the concave lower surface providing a longitudinal channel extending between the hub region and the outer end region of a wing member, and

a downwardly inclined region at the outer end of said channel of each wing member closing at the end of each channel and providing a downward movement of air and thus providing additional lift to said boomerang;

at least one rib extending outward from said hub region along the bottom surface of each said wing member;

a rim extending around the periphery of the boomerang, interconnecting outer end regions of said wing members; and

a stabilizing axle attached to said hub region and extending downward in a direction generally perpendicular to the general plane of said wing members for providing an orienting force causing the boomerang to be rotated in flight to a horizontal operating plane with said stabilizing axle pointing downward following the boomerang being launched in a vertical plane.

3,955,818

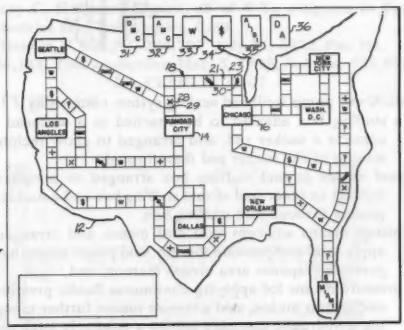
BOARD GAME APPARATUS

Thomas A. Hawke, 3133 Vernon, Brookfield, Ill. 60513

Filed June 12, 1974, Ser. No. 469,274

Int. Cl.² A63F *3/00*

U.S. Cl. 273—134 AC **8 Claims**



1. In game apparatus, the improvement comprising:

a game board having a playing area containing smaller areas and paths including subdivisions interconnecting said smaller areas;

a plurality of movable position-marking player pieces distinguishable from one another and movable from one to another of said smaller areas along said subdivisions, said pieces being associated individually with the players of the game and being moved by their associated players;

first move determining means for ascertaining at random the moves of the player pieces along said playing area;

a single movable position-marking object piece distinguishable from each one of said player pieces, said object piece being movable directly from one smaller area to another smaller area by any one of the players;

second move determining means visually distinguishable from and separate from said first move determining means for ascertaining at random the moves of the object piece from one of the smaller areas to another one of the smaller areas;

visually distinguishable indicia on said playing area to direct in accordance with the game rules the movement of said object piece from one of said smaller areas to a randomly-selected other one of said smaller areas in response to said second move determining means;

a first set of playing card means having indicia thereon for game playing purposes according to the game rules;

indicia on said game board for designating according to the game rules the taking by a player of one of said first playing card means when player pieces are moved thereto; and

a second set of playing card means including pairs of playing cards, each one of said pairs including a card having on its face object-piece action indicia and a card having a blank face, said object-piece indicia designating object-piece action determined by the first playing card means taken by the players in accordance with the game rules and said blank faces

designating object-piece non-action in accordance with the game rules so that each one of the players of the game may use at least one object-piece action indicia bearing card and at least one non-action blank card.

3,955,819

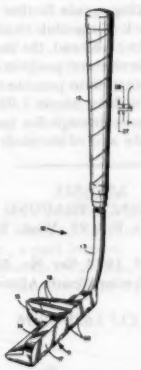
GOLF PUTTER

Bernard A. Yokich, 16 Samoset Drive, Salem, N.H. 03079

Filed Nov. 3, 1975, Ser. No. 627,974

Int. Cl.² A63B *53/04*

U.S. Cl. 273—164 **6 Claims**



1. A golf putter having a plurality of lifting grooves in its bottom surface comprising:

a. a handle;

b. a shaft;

c. a putting head connected by said shaft to said handle; and,

d. a bottom surface on said putting head consisting of a plurality of lands and grooves in which the grooves, extending from the back toward the striking face of the club, have an angle of inclination in the range of 4° to 8° with respect to the lands.

3,955,820

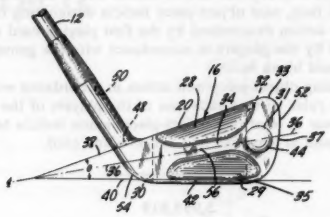
GOLF CLUB HEAD

Alastair J. Cochran, Sutton Coldfield, England; John W. Jepson, Marion, Mass.; Edward R. Woolley, Rancho Santa Fe, Calif., and Francis deS. Lynch, Mattapoisett, Mass., assignors to Acushnet Company, New Bedford, Mass.

Continuation-in-part of Ser. No. 311,821, Dec. 4, 1972, abandoned, which is a continuation-in-part of Ser. No. 146,255, May 24, 1971, abandoned, which is a continuation-in-part of Ser. No. 106,690, Jan. 15, 1971, abandoned. This application July 20, 1973, Ser. No. 381,050

Int. Cl.[2] A63B 53/04

U.S. Cl. 273—167 F 16 Claims



1. A golf club iron comprising a shaft and a steel club head having heel and toe portions and having a socket positioned in the back of the club head in the area of the toe, weighting means for said club head, said weighting means including added weight secured in said socket of density not less than 16 grams per cubic centimeter, the nearest point of said socket being spaced inwardly from the top and sole peripheries of the toe at least one sixteenth inch and at least thirty second but not more than three quarters inch from the outer periphery of the toe, and said weighting means further including at least one identation in the back of the club head between the said socket and the heel of the club head, the mass and position of the added weight and the size and position of the indentation being sufficient in combination to provide the club head with a radius of gyration of at least about 1.05 inches measured about an axis which passes through the centroid of the club head and is parallel to the axis of the shaft of the club.

3,955,821

GOLFER'S STANCE TRAINING DEVICE

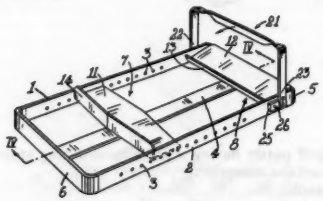
Oliver T. Spedding, P.O. Box 95, West, Krugersdorp 1742, South Africa

Filed Aug. 27, 1974, Ser. No. 500,879

Claims priority, application South Africa, Aug. 31, 1973, 73/2591

Int. Cl.[2] A63B 69/36

U.S. Cl. 273—187 B 9 Claims



1. Apparatus for use in training golfers, comprising: a retaining structure; a first movable foot rest; a second foot rest; first means for movably supporting said first foot rest in said retaining structure; and second means for supporting said second foot rest in said retaining structure, said first and second foot rests being supported in a spaced apart arrangement, each foot rest having a foot supporting surface, the first foot rest being supported to rock, in an operative position of the apparatus, between a first extreme position in which its foot supporting surface is substantially horizontal and a second extreme position in which its foot supporting surface is inclined to the horizontal and faces outwardly relative to the second foot rest.

3,955,822

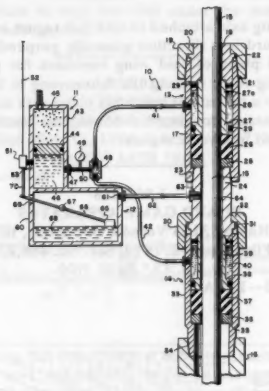
ROD PUMP STUFFING BOX CONTROL SYSTEM

Richard Eugene Irby, Irving, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 28, 1975, Ser. No. 563,287

Int. Cl.[2] F16J 15/52

U.S. Cl. 277—2 6 Claims



1. A rod pump wellhead sealing system comprising:

a stuffing box adapted to be attached to a wellhead and encircle a sucker rod, and arranged to allow reciprocal motion of the sucker rod therethrough;

seal means in said stuffing box arranged to peripherally contact an inner wall of said stuffing box and a sucker rod passing through said stuffing box;

piston means adjacent said seal means and arranged to apply axial compression thereto, said piston means having pressure response area means thereon; and,

pressure means for applying continuous fluidic pressure to said piston means, said pressure means further comprising a hydraulic assembly having a relatively large piston in a hydraulic cylinder with biasing means in said cylinder acting on one side of said piston, and hydraulic fluid on the opposite side of said piston, said hydraulic fluid adapted to receive pressure force from said piston and said assembly having conduit means communicating said fluid to said pressure response area means on said piston means.

3,955,823

OIL RING ASSEMBLY

Edward Frederick Willem, Baltimore, Md., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Nov. 19, 1974, Ser. No. 525,136

Int. Cl.[2] F16J 9/06

U.S. Cl. 277—163 5 Claims

1. An oil ring assembly for internal combustion engine pistons comprising in combination:

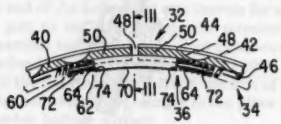
an annular piston ring member having a gap in the circumference thereof for accommodating radial expansion and contraction of said ring member and having a radially

arcuate circumferential groove in the inner periphery thereof;

a radially expandable spring means having a gap in the circumference thereof, in said groove for radially expanding said ring member,

said spring means comprising a helically wound coil spring means extending around the circumference of said groove and having opposite, spaced end portions; and

bridging means held in said groove by said spring means for spanning said gap between adjacent end portions of said



ring member for reducing wear of said end portions during expansion and contraction of said ring member,

said bridging means comprising a cylindrical arcuate segment in said groove, having a length greater than said gap in said ring member,

including circumferentially extending pin means, extending into an inner diameter of said coil spring means, forming shoulder means with said segment for abutting engagement with said opposite end portions of said coil spring means.

3,955,824

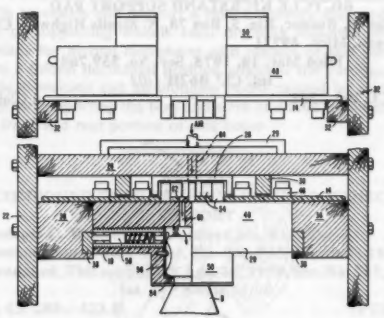
CHUCK MEMBER INCLUDING FLUID DRAFT

Roy S. Arrandale, Elmira; James H. Cady, Horseheads, and Leroy C. Hartman, Elmira, all of N.Y., assignors to Dart Industries Inc., Los Angeles, Calif.

Division of Ser. No. 274,705, July 24, 1972, Pat. No. 3,884,184. This application Mar. 5, 1975, Ser. No. 555,664

Int. Cl.² B23B *31/02*

U.S. Cl. 279—1 R **2 Claims**



1. A chuck assembly principally composed of a non-conductive material and which includes at least two separably mating sections having a cavity formed therein and shaped to receive and retain an extended article portion and at least one passageway positioned remotely from the opening of said cavity but extending to the cavity from the exterior of said assembly and adapted to accept a fluid medium to purge said cavity and wherein said sections are movably affixed to means that enables such to be transversely positionable with respect thereto.

3,955,825

HOLDING MECHANISM FOR SKI BOOTS

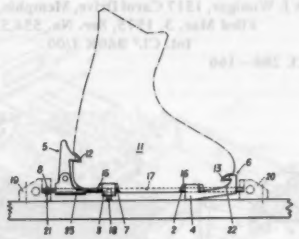
Axel R. Kubelka; Gottfried Schweizer, both of Vienna, and Josef Svoboda, Schwechat, all of Austria, assignors to Gertsch AG, Zug, Switzerland

Filed Mar. 24, 1975, Ser. No. 561,288

Claims priority, application Austria, Mar. 22, 1974, 2419/74

Int. Cl.² A63C *9/08*

U.S. Cl. 280—618 **14 Claims**



1. In a releasable ski binding including first and second longitudinally spaced binding parts mounted on a ski for releasably engaging and releasably holding a bottom member on which a ski boot is mounted to said ski, the improvement comprising wherein said bottom member comprises at least one elongated rod having a width substantially less than the width of said ski boot and has at least one crossbar thereon extending laterally outwardly of said elongated rod and has holding means thereon for engaging said ski boot to hold said ski boot in engagement with said crossbar and said elongated rod, opposite ends of said elongated rod releasably engaging said first and second binding parts to releasably hold said elongated rod to said ski, one of said first and second binding parts releasably holding one end of said elongated rod against at least a lateral movement and locking means on said elongated rod cooperable with one of said first and second binding parts for preventing a longitudinal movement of said elongated rod relative to said ski.

3,955,826

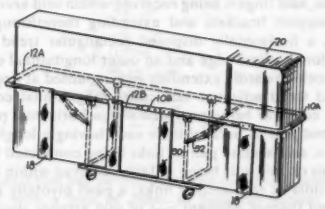
MATTRESS CARRIER

Ernest H. Riedesel, Bennett, Iowa, assignor to Raymond Lee Organization Inc., a part interest

Filed Feb. 18, 1975, Ser. No. 550,667

Int. Cl.² B62D *21/14*

U.S. Cl. 280—35 **3 Claims**



1. Apparatus for carrying a mattress, comprising:

a horizontal rectangular open frame having first and second U-shaped hollow tubular members, the free ends of the legs of one member fitting telescopically within the corresponding free ends of the corresponding legs of the other member whereby the overall length of the frame can be varied;

a plurality of rigid, parallel U-shaped members, each member being slidibly secured at each end to a corresponding side of the frame, extending downwardly therefrom and then extending transversely between the sides of the frame; and

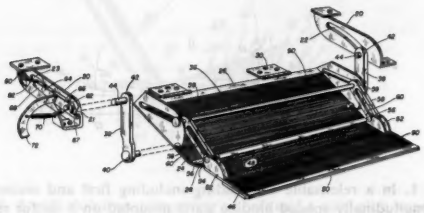
brace means securing the members to the frame for additional rigidity.

3,955,827

STOWABLE STEP FOR VEHICLES

Joseph J. Wonigar, 1517 Carol Drive, Memphis, Tenn. 38116

Filed Mar. 3, 1975, Ser. No. 554,526
Int. Cl.² B60R 3/00
U.S. Cl. 280—166 5 Claims



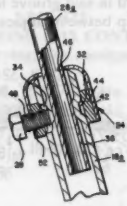
1. A stowable step to be used in conjunction with a vehicle of the type having a body with a door opening therein and a frame means beneath and inward from said opening, comprising a pair of parallel support brackets mounted beneath said opening and extending substantially horizontally outwardly from said frame means and substantially perpendicular thereto, each support bracket having an outwardly and downwardly extending arcuate slot therein, a substantially rectangular plate having an inner longitudinal edge and an outer longitudinal edge, said rectangular plate being hingedly connected to said frame means for pivotal movement about a substantially horizontal axis perpendicular to said support brackets, a pair of spaced parallel flanges attached to said rectangular plate and extending upwardly therefrom beneath said support brackets and parallel thereto, each of said flanges having an upwardly and outwardly projecting slot therein, a horizontally extending rod received in the slots of said flanges for sliding movement therein substantially parallel to the hinge axis of said rectangular plate, a pair of parallel links pivotally connected at their lower ends to the outer portions of said flanges, respectively, the upper end of each link being provided with a finger extending horizontally at right angles thereto, said fingers being received within said arcuate slots of said support brackets and extending therethrough, respectively, a horizontally disposed rectangular tread having an inner longitudinal edge and an outer longitudinal edge, a pair of spaced upwardly extending ears mounted at opposite sides of said tread adjacent said inner longitudinal edge of said tread, each ear being provided with a horizontal pin thereon, a second pair of parallel links each having a longitudinal slot therein, said second pair of links being connected to said rod, the pins on said ears being slidably received within the longitudinal slots of said second links, a pawl pivotally mounted at one end thereof adjacent one of said arcuate slots, said pawl having an end opposite from said one end engagable with the finger projecting through said one arcuate slot when said finger is positioned at the rearwardmost end of said one arcuate slot, thereby retaining the finger therein, means resilient urging said opposite end of said pawl into engagement with said finger, and release means attached to said pawl for permitting pivotal movement of the pawl against the action of said resilient means to move the opposite end of said pawl out of engagement with said finger.

3,955,828

BICYCLE HANDLEBAR ASSEMBLY

Robert J. Boudreau, Bedford, Pa., assignor to Hedstrom Co., Bedford, Pa.

Filed Jan. 6, 1975, Ser. No. 538,760
Int. Cl.² B62K 21/22
U.S. Cl. 280—279 2 Claims



1. An improved handlebar assembly comprising a head tube, a front fork having a tubular stem slidably and rotatively received in the head tube with its upper end projecting from the top of the head tube, means defining a flat area on the inner wall of the stem near its upper end, a tubular upper reach bar having its forward end engaged over the projecting end of the stem, a collar slidably engaged over the projecting end of the stem above the reach bar and for retaining said bar and on said stem, a tubular handlebar post, means defining a flattened area on the handlebar post extending an appreciable distance along the length of the post, said post being slidably received in the collar and tubular stem when the flat areas on the post and stem are in opposition, said flattened areas preventing relative rotation between the post and stem, an opening in the stem opposite the flattened area therein and a set screw threaded into the collar which, when turned down, projects through the opening in the stem and engages the post therein, securing it at a selected axial position relative to the stem.

3,955,829

BICYCLE KICKSTAND SUPPORT PAD

Thomas M. Bussler, Rte. 5, Box 78, N. Straits Highway, Cheboygan, Mich. 49721

Filed Mar. 19, 1975, Ser. No. 559,764
Int. Cl.² B62H 1/02
U.S. Cl. 280—301 4 Claims

1. A support pad intended for use with the terminal end of an arm of a conventional kick stand for a bicycle wherein the terminal end is pivotably supported by the arm for movement between a storage position spaced from the ground and an operative position adapted to engage the ground, the support pad comprising, in combination:

a disc shaped base member consisting of a flat bottom surface, a somewhat convex top surface and cylindrical side wall surfaces;

a boss member projecting upwardly from the top surface of the disc shaped base member, the boss projection and disc shaped base being integrally formed as a unitary member, said boss extending integrally from the top surface of the disc shaped base member and centrally thereof and projecting upwardly therefrom in a direction generally normal to the plane of the disc shaped base member, the boss projection being of a generally elongated cylindrical configuration having a flat front end and a closed curved back end; and

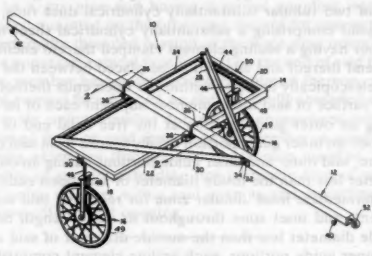
a socket defined inwardly of the boss member and accessible from the exterior thereof and adapted to receive the terminal end of the kick stand arm therein for affixing the support pad to the kick stand arm terminal end, the socket member being of an elongated cylindrical configuration defined interiorally of the boss member and opening out of the flat front end thereof, the axis of the socket being disposed at an angle relative to the plane of the disc base member bottom surface.

3,955,830

FOLDABLE BOAT TRAILER

Richard H. Hardwick, 1753 Spring St., Smyrna, Ga. 30080

Filed Aug. 8, 1974, Ser. No. 495,552
Int. Cl. B60p *3/10*
U.S. Cl. 280—414 B **2 Claims**



1. Foldable boat trailer comprising a carriage of sufficient width to cradle and support a boat extending thereunder, a pair of supporting wheels each pivotally mounted to said carriage for pivotal movement with respect to said carriage from a folded horizontal position adjacent the carriage to a vertical position and an elongate boom carried by said carriage for supporting the bow and stern of a boat from beneath the front and rear portion of said boom.

3,955,831

COMPOUND TRAILER HITCH WITH GOOSENECK SUPPORT

Woodrow C. Whitchurch, Paonia, Colo. 81428

Continuation-in-part of Ser. No. 449,023, March 7, 1974, abandoned. This application Apr. 14, 1975, Ser. No. 567,860
Int. Cl.[3] B62D *53/00*
U.S. Cl. 280—423 R **11 Claims**

1. A compound trailer hitch for interconnecting the trailing end of a vehicle having its trailing end spaced rearwardly of the rear axle to the leading end of a two-wheel type trailer having its wheels rearwardly of its center of gravity whereby to normally place part of the trailer weight upon the vehicle, which includes in combination:

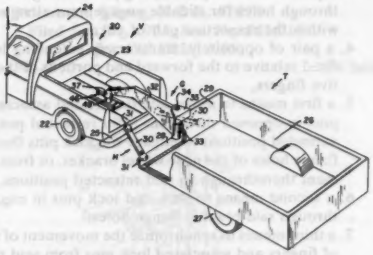
a. a hitching means comprising:

i. a pair of hitch links, each having a swivel connection means at its front end and rear end;

ii. a swivel connector at each side of the trailing end of the vehicle, with each swivel connector connecting with the front end swivel connection means of a hitch link and

iii. a swivel connector at each side of the leading end of the trailer, with each swivel connector connecting with the rear end swivel connection means of a hitch link;

wherein the swivel connectors on the trailer and on the vehicle are arranged such that the spacing between the trailer swivel connectors is greater than the spacing between the vehicle swivel connectors whereby the hitch links are spaced apart and converge forwardly with the forward projections of the converging links meeting at a point near the vehicle axle whenever the vehicle and trailer are in alignment; and



b. a load supporting means comprising:

i. a cantilever arm outstanding from the leading end of the trailer and extending forwardly of the trailing end of the vehicle;

ii. a connective means on the vehicle to engage the cantilever arm to receive loads imposed onto the vehicle from the trailer through the arm and

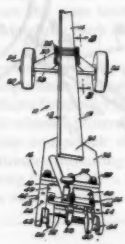
iii. a shifting means associated with the arm and the connective means to effect a continuous flexible engagement of the cantilever arm and the connective means as the relative positions of the vehicle and trailer change, as when turning.

3,955,832

AIRCRAFT TOW BAR DEVICE

Samuel Kalmanson, 8320 SW. 23 St., Miami, Fla. 33155

Filed June 19, 1975, Ser. No. 588,210
Int. Cl.[2] B60D *1/14*
U.S. Cl. 280—476 R **13 Claims**



1. An aircraft tow bar device including means for selective engagement with a pair of holes in opposed flanges of a bracket fixed to the main strut of the nose wheel assembly of an aircraft comprising:

A. a main stem including,

1. a rear end portion providing a hitch means fixed relative to its distal end for attachment to a tow vehicle, and

2. a forward end portion;

B. a wheel assembly fixed intermediate said rear and forward end portions;

C. a tow head fixed relative to the distal end of said forward end portion including,

1. a generally E-shaped main frame providing,
   a. a transverse base portion,
   b. opposed forwardly extending, parallel outer arms from said base portion,
   c. a forwardly extending central arm from said base portion, bisecting the distance between said outer arms and defining a pair of forwardly opening yokes;
2. a pair of spaced apart, parallel, transverse rods spanning said parallel yokes and being fixed relative to said outer arms,
3. a pair of forwardly extending parallel fingers including through holes for slidable engagement along said rods within the respective pair of yokes,
4. a pair of oppositely, transversely extending lock pins fixed relative to the forward end portions of the respective fingers,
5. a first means to move said fingers and associated lock pins in opposed directions from retracted positions to extended positions to engage the lock pins through the flange holes of the nose wheel bracket, or from engagement therethrough to said retracted positions,
6. a second means to lock said lock pins in engagement through said bracket flange holes,
7. a third means to synchronize the movement of said pair of fingers and associated lock pins from said retracted positions to said extended positions and from the extended positions to said retracted positions.

3,955,833

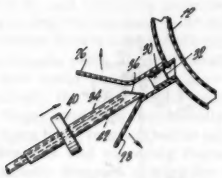
METHOD AND APPARATUS FOR STERILE HANDLING OF FLUIDS

Jerome A. Silbert, 444 E. 84th St., New York, N.Y. 10028

Continuation-in-part of Ser. No. 433,530, Jan. 15, 1974, abandoned. This application Nov. 11, 1974, Ser. No. 522,426

Int. Cl.² F16L *35/00*

U.S. Cl. 285—3 **1 Claim**



1. A connection device comprising a tube having a membrane on end thereof and tab means at the other end of said tube, hollow connector means adapted to fit in said tube and between said tab means, said hollow connector being moveable in said tube between a first position in which said membrane is intact and a second position in which the hollow connector punctures said membrane, a second membrane covering the end of the hollow connector in said tube, a hollow needle in said hollow connector moveable between a first position in which said second membrane is intact and a second position in which said second membrane is punctured by said hollow needle.

3,955,834

APPARATUS FOR CONNECTING DUCTS WITH A SELF-SEALING JOINT

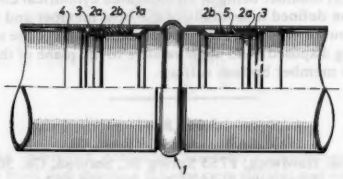
Ake Ahlrot, Jonkoping, Sweden, assignor to Aktiebolaget Svenska Flaktfabriken, Nacka, Sweden

Continuation-in-part of Ser. No. 328,399, Jan. 31, 1973, abandoned. This application Feb. 21, 1975, Ser. No. 551,555

Claims priority, application Sweden, Feb. 11, 1972, 1688/72

Int. Cl.² F16L *21/02*

U.S. Cl. 285—110 **14 Claims**

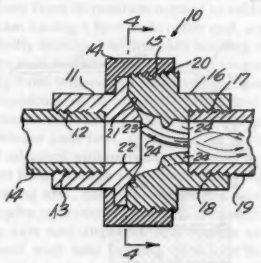


1. A duct-connecting joint for sealingly connecting the open ends of two tubular substantially cylindrical duct runs, said duct joint comprising a substantially cylindrical sheet metal member having a sealing element clamped thereto encircling each end thereof and adapted to be placed between the runs and telescopically engaged within the open ends thereof, the outer surface of said metal member adjacent each of its ends having an outer guide portion at the free axial end of said member, an inner guide portion axially spaced from said outer portion, said outer and inner guide portions having an outside diameter less than the inside diameter of said open ends, and an intermediate inset annular zone for receiving said sealing element, said inset zone throughout its entire length having outside diameter less than the outside diameter of said outer and inner guide portions, each sealing element comprising a circumferential base portion extending axially along the inset zone, and at least one sealing flange portion having an outwardly-directed surface normally projecting outwardly at an obtuse angle to said base portion before the tubular members are telescopically engaged on said metal member and adapted to be deflected inwardly to a larger obtuse angle to said base portion, said sealing flange and base portion respectively having inwardly-directed surfaces meeting at a sharp-angled corner, forming a peak at the outside corner and having biasing means including clamping means for said base portion cooperating with said peak to bias the sealing flange outwardly toward the aforesaid obtuse angular position, said clamping means comprising strip means surrounding said base portion and disposed parallel to said inset zone to cause said base portion to bear against the zone of said metal member to insure effectiveness of said biasing means to urge said flange toward its obtuse radial position, said inset annular zone extending axially a distance corresponding at least to the total length of both the base and flange portions of the sealing element and having a cylindrical seating portion of uniform diameter along the length where it receives the flange portion of said sealing element, said seating portion of said zone terminating at its inner end adjacent said inner guide portion, so that the flange portion may be deflected inwardly to a greater obtuse angle and rest in said inset zone upon the telescoping engagement of the tubular member thereon, said sealing flange when projecting outwardly having an outside diameter greater than the inside diameter of said open ends, and when deflected inwardly having an outside diameter exceeding that of the base portion and the inner guide portion, so as to provide a tight seal about the entire periphery of the sealing flange.

3,955,835
GAS ECONOMIZER

Percy L. Farrington, 2410 Lincoln Manor Drive, Flint, Mich. 48507

Filed Feb. 21, 1975, Ser. No. 551,732
Int. Cl.² F16L 25/00
U.S. Cl. 285—175 2 Claims

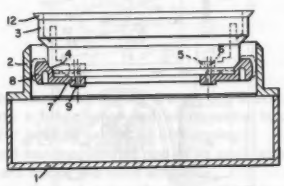


1. A gas economizer for connection to the burner of an appliance comprising a male pipe union member having internal threads at one end thereof for connection to a gas pipe and external threads on the opposite end thereof, a female pipe union member having internal threads at one end for connection to a gas pipe and having a swivel coupling internally threaded mounted on the other end thereof for connection to the externally threaded portion of the male pipe union member, a convexed conical face formed on the end of said female union member having said coupler mounted thereon, a concaved conical face formed on the externally threaded end of said male union member for sealing engagement with the convexed face on said female union member, a converging opening extending through said male union member, and a plurality of spirally extending fins integrally formed on said male union member within said opening and projecting radially inwardly of said opening.

3,955,836
OUTLET FOR UNDERFLOOR AND CONCEALED INSTALLATIONS

Hans-Martin Traupe, Frenssenstr. 51, 2 Hamburg 55, Germany

Filed Jan. 25, 1974, Ser. No. 436,653
Claims priority, application Germany, Jan. 26, 1973, 7302905[U]
Int. Cl.² F16L 5/00
U.S. Cl. 285—208 5 Claims

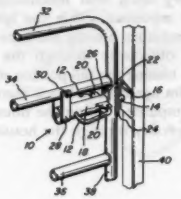


1. An outlet for insertion into a tubular opening for underfloor and concealed installations, which includes a tubular body having one end formed with a peripheral conical surface diverging in the direction toward the opposite end and converging toward the axis of said tubular body in the opposite direction, a split clamping ring in engagement with said conical surface and formed with a radially extending periphery having a greater diameter than the diameter of said tubular body, radially inwardly extending overlying formations on said tubular body and said split clamping ring normally spaced apart in the normal condition of said ring, and means to draw said extensions toward each other to move said split ring on said conical surface toward said opposite end and expand said split ring, so that said ring will engage the wall of a tubular opening in which said tubular body is inserted, with said tubular body adjustable both axially and angularly to conform to the surface of the structure in which said tubular opening is provided.

3,955,837
LATCH

Lars N. Christensen, Viborg, S. Dak. 57070

Filed Jan. 20, 1975, Ser. No. 542,619
Int. Cl.² E05C 1/06
U.S. Cl. 292—173 19 Claims



1. In combination, a farm gate latch comprising:

A. a cylindrical casing;

B. a bolt for engaging a catch;

C. means for mounting said bolt for limited slidable movement within said casing and for positioning said bolt within said casing with an end extending from said casing sufficiently far to engage a catch;

D. at least one pivotally mountable, planar, elongate, handle adapted for moving said bolt into disengagement from said catch, which handle is mounted for pivotal rotation substantially entirely along a plane, and has a first end and a second end, which first end is adapted to operate said bolt to disengage from said catch, which handle is configured for application of a grip-like force between said first and second ends, and which second end is adapted for abutment or recess with other structure of the gate latch or with structure of a gate to which the catch is attached whereby a force cannot be applied to said second end when the gate latch is closed to frustrate operation of the latch by farm animals such as cattle and horses; and,

E. an attachment yoke adapted for pivotally mounting a said handle comprising a unitary sheet including at least a pair of opposing sections forming a generally U-shaped channel member and which sections provide a pivot bearing for a said handle and which sheet includes a surface adapted for stationary mounting of said yoke to either a gate or said casing to provide a fulcrum against which a said handle acts as it is pivoted.

3,955,838
DOOR LOCK

Charles Dean, 118 Reid, Vaudreuil, Quebec, Canada

Filed Mar. 20, 1975, Ser. No. 560,490
Int. Cl.² E05C 1/02
U.S. Cl. 292—179 9 Claims

1. A door latch mechanism comprising:

a housing adapted to be mounted in a door, the housing having an open end;

a primary latch bolt mechanism slidably mounted within the housing, the primary latch bolt mechanism having a head portion and an integral tail portion, a forward section of the head portion situated at the open end of the housing

projecting outwardly through the open end of the housing and adapted to engage a cooperating opening in a strike;

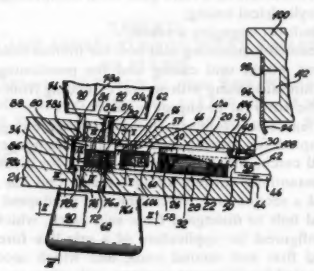
an auxiliary bolt slidably mounted within the housing at the open end thereof and situated adjacent to and engaging the head portion of the primary latch bolt mechanism, a forward portion of the auxiliary bolt projecting outwardly through the open end of the housing, the forward portion of the auxiliary bolt adapted to be urged rearwardly upon rearward movement of the head portion of the primary latch bolt mechanism;

a block member slidably mounted within the housing and situated rearwardly from the auxiliary bolt and head portion;

a first compression member mounted within the housing and engaging the block member and auxiliary bolt so as to bias the auxiliary bolt away from the block member;

a second compression member mounted within the housing, the second compression member engaging the tail portion of the primary latch bolt mechanism and projection means rigidly mounted within the housing, the second compression member biasing the forward section of the head portion outwardly through the open end of the housing while biasing the tail portion of the primary latch bolt mechanism against the block member;

a stop member mounted within the housing on a shaft extending transversely through the housing;



at least one handle rigidly mounted on the shaft exterior to the housing, the at least one handle adapted to permit the transverse shaft to be moved in a longitudinal direction thereof, whereby the stop member is advanced out of engagement with the block member;

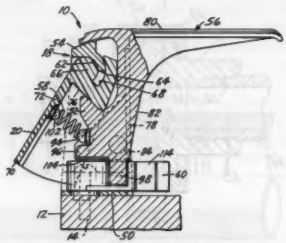
the primary latch bolt mechanism and auxiliary bolt adapted to be urged rearwardly upon engagement of the forward section of the head portion of the bolt mechanism with a strike, thereby compressing the first and second compression members, a force generated by the first compression member exceeding a force generated by the second compression member, whereby a resultant force is applied to the block member, urging the block member rearwardly into contact with the stop member, the forward section of the head portion engaging a cooperating opening in the strike and being projected into the opening by the second compression member while the strike retains the auxiliary bolt within the housing, the at least one handle adapted to be moved axially whereby the stop member is advanced out of engagement with the block member, whereby the block member and the tail portion of the latch bolt mechanism are urged rearwardly by the first compression member, thereby disengaging the head portion of the door latch mechanism from the cooperating opening in the strike.

3,955,839

DOOR LATCH

George J. Praska, Crystal, Minn.; Daniel W. Wilson, Cameron, Wis., and Gerald E. Peterson, St. Paul, Minn., assignors to Wright Products, Inc., St. Paul, Minn.

Filed Feb. 28, 1975, Ser. No. 553,878
Int. Cl.² E05C 3/08
U.S. Cl. 292—226 3 Claims



1. A surface-mounted door latch comprising:

a housing having a bearing surface,

a latch bolt set on said bearing surface for pivotal movement from an extended position to a retracted position,

tongue and groove means associated between said latch bolt and said housing confining the latch bolt to a pivoting motion when in position on said bearing surface,

a handle pivotally mounted over said latch bolt on an axis spaced from that upon which said latch bolt pivots, said handle retaining the latter in position on said bearing surface,

spring means urging the latch to an extended latching position, and

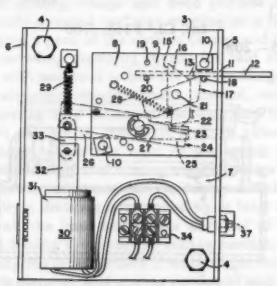
means on said handle for camming the latch bolt to the retracted position.

3,955,840

DOOR RELEASE MECHANISM

William W. Rawls; Alex Buchholz, both of Mountaintop, and John P. Walsh, Edwardsville, all of Pa., assignors to Cornell Iron Works, Inc., Wilkes-Barre, Pa.

Filed Aug. 30, 1974, Ser. No. 502,016
Int. Cl.² E05C 3/12
U.S. Cl. 292—229 7 Claims



1. A door release mechanism comprising, a housing having an elongated slot therethrough, sash means including a distal elongated sash element having an elongated slot therethrough extending longitudinally of said sash element, said sash element disposed through said housing slot with said sash element slot within said housing, said housing slot dimensions providing a close sliding fit with the width and thickness of said sash element, means providing a constant pulling force on said sash element away from said housing slot, an elongated holding cam intermediately pivoted within said housing dis-

posed normal to said sash element and having a tongue at one end disposed through said sash element slot and retaining a portion of said sash element within said housing against the effect of said pulling force means, said holding cam having a foot at its other end, an elongated release cam intermediately pivoted within said housing disposed normal to said holding cam and having a shoulder adjacent one end engaging said holding cam foot and precluding pivotal displacement of said holding cam from its position normal to said sash element, said release cam having a foot at its other end, a solenoid including a coil fixedly mounted within said housing with a central axis normal to said release cam foot, an elongated actuating arm extending from within said coil fixed for longitudinal reciprocating displacement in alignment with said coil central axis, pivotal means connecting the free end of said actuating arm to said release cam foot, spring means joined to said release cam foot adjacent said pivotal connecting means and applying a constant force to urge said release cam foot away from said coil actuating arm, and circuit means connected to said solenoid whereby operation of said circuit means reciprocates said actuating arm and displaces said release cam shoulder from engagement with said holding cam foot so that the pulling force on said sash element angularly displaces said holding cam to withdraw its tongue from said sash element slot as said sash element is withdrawn from said housing slot.

3,955,841

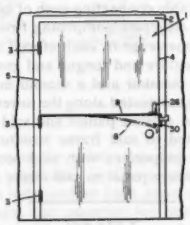
HOLDING BAR FOR A CLOSURE

Brooks Walker, 807 Francisco St., San Francisco, Calif. 94109

Filed Mar. 4, 1974, Ser. No. 448,001

Int. Cl.² E05C *3/00*, *17/14*

U.S. Cl. 292—259 R **7 Claims**



1. In combination with a door frame, and a door mounted therein having a hinge edge and an opposite latch edge, a safety latch for holding said door comprising:

an elongated bar provided at one of its ends with means to secure said bar to the door structure,

said bar being formed at its other end with a laterally offset portion having a free end,

a keeper mounted on said frame at the latch edge of said door, and formed to provide an opening for receiving said free end therein to prevent opening movement of said door from closed position,

a second keeper mounted on said frame at said latch, said second keeper being adapted to receive said free end of said bar therein with said bar angularly disposed relative to the plane of said frame, whereby said door may be partially opened with said bar preventing further opening.

3,955,842

LOCKING DEVICE

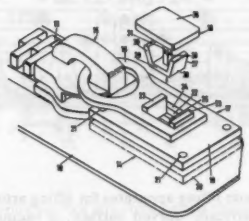
Shirley Edwards, Hawkhurst, England, assignor to Envopak Limited, England

Filed Dec. 5, 1973, Ser. No. 421,930

Claims priority, application United Kingdom, Dec. 13, 1972, 57390/72

Int. Cl.² B65D *33/34*

U.S. Cl. 292—307 R **12 Claims**



1. A locking device for positively locking a closure member of an article to be locked in an article closing position, said locking device comprising:

a base member permanently securable to an article to be locked and including means for aligning a closure member of said article in an article closing position with said closure member overlapping said base member;

said closure member having therein receiving means for receipt therein of said aligning means when said closure member is in said article closing position and overlapping said base member;

said aligning means having therein entrance means for receiving a portion of a disposable locking element to prevent disengagement of said closure element from said aligning means;

means for permanently securing said base member to said article; and

a disposable locking element completely separate from said base member and made of synthetic plastics material, said locking element including:

a resiliently deformable plug part of substantially arrowhead configuration which is resiliently yieldable and slidably insertable through, but not slidably retractable from, said entrance means of said aligning means; and

a head part connected to said plug part by a rupturable portion, said head part, when said plug part is inserted through said entrance means into a locking position, being outside said aligning means and covering a portion of said closure member, thereby forming means for preventing disengagement of said closure member from said aligning means, said head part having accessible manual manipulation means for allowing said head part to be rupturably removed from said plug part after said plug part is in said locking position, to thereby allow said closure member to be disengaged from said aligning means and the thus separate plug part to be removed, whereafter said base member and said aligning means can be re-used with a fresh disposable locking element to relock said closure member when desired.

3,955,843
VACUUM-LIFTING APPARATUS

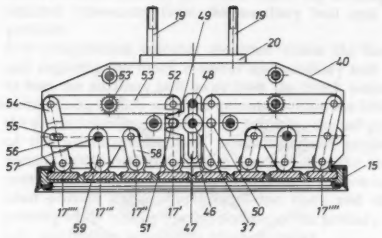
Ludger Ottenhues, Weststr. 38, 4536 Brochterbeck; Wolfgang Schlaupitz, Grunring 85, and Dieter Kippenbrock, Bergstr. 46, both of 4407 Emsdetten, all of Germany

Filed Oct. 15, 1974, Ser. No. 514,826

Claims priority, application Germany, Nov. 16, 1973, 7340967[U]

Int. Cl.² B66C 1/02

U.S. Cl. 294—64 R **8 Claims**



1. In a vacuum lifting apparatus for lifting articles having an axially symmetrically curved surface, a vacuum lift device comprising: a flexible main plate, a plurality of rigid side-by-side elongated segments carried on said main plate for angular movement relative to each other to define a curved configuration adapted to the curved surface of the article, a plurality of seals associated with said segments and projecting from said main plate, a sealing rim of resilient material projecting from said main plate to engage said article and to form an air seal therewith and encircling said segments and said seals, locking lever means connected to said segments and movable between a locking position to lock the segments in positions defining a curved configuration and a release position in which said segments are free to shift relative to one another, operating means actuated by an upward lifting force applied to said vacuum lifting device to operate said locking lever means into said locked position to hold said segments in a locked curved configuration, and biasing means operable upon release of said lifting force from said operating means for releasing said segments for shifting relative to one another.

3,955,844
CRANE CABLE ATTACHMENT

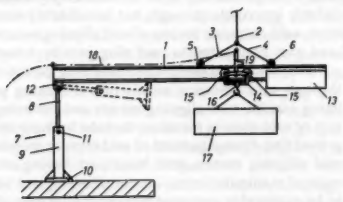
Pierre M. T. de Castella, Monnaz sur Morges, Switzerland, and Rene A. Fichter, Douglaston, N.Y., assignors to Baumatic S.A., Morges, Switzerland

Filed Aug. 5, 1974, Ser. No. 494,997

Claims priority, application Switzerland, Aug. 7, 1973, 11425/73

Int. Cl.² B66C 1/00

U.S. Cl. 294—67 R **8 Claims**



1. A crane cable attachment comprising a rail, means for suspending the rail transverse to a crane cable, a load-carrying carriage mounted for movement along the rail between a lifting position disposed in extension of a cable supporting the rail and a loading and unloading position towards one end of the rail, and an elongate prop pivotally connected to said one end of the rail for movement between a position protruding from the rail to be able to take support on a base surface where a load is to be delivered or taken up and a folded-away lifting position against and generally parallel to the rail; means for selectively elongating and shortening said prop, particularly during loading and unloading said carriage.

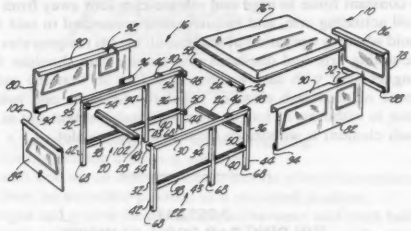
3,955,845
CONVERTIBLE REMOVABLE STRUCTURE FOR THE BED OF A TRUCK

Willy T. Werner, 12541 Racine, Detroit, Mich. 48228

Filed Dec. 20, 1974, Ser. No. 534,768

Int. Cl.² B60P 3/42

U.S. Cl. 296—10 **9 Claims**



8. A convertible structure removably mounted to a bed of a truck, comprising:

a frame structure;

means for removably connecting said frame structure to the bed of the truck so that said frame structure extends generally upwardly therefrom;

a plurality of closure panels; and

means for removably connecting each of said closure panels to said frame structure comprising first means for connecting the upper edge of each of said closure panels to said frame structure and tongue and groove means comprising a first member and a second member, said first member being connected along the lower depending edge of each of said closure panels and said second member being connected to said frame structure, wherein said first member cooperates with said second member to secure said closure panel to said frame structure.

3,955,846
REVERSIBLE SEAT APPARATUS

David T. Murphy, Forest City, Iowa, assignor to Winnebago Industries, Inc., Forest City, Iowa

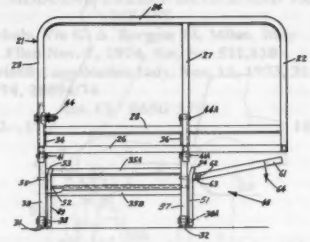
Filed Jan. 2, 1975, Ser. No. 537,948

Int. Cl.² B60N 1/02

U.S. Cl. 296—65 R **28 Claims**

1. In a vehicle having a floor, a side wall and a front wall: a seat means for selectively seating one or more persons facing the front wall or facing away from the front wall, said seat means including a frame, backrest means and seat means mounted on the frame, support means securable to the floor, leg means movably mounted on the support means and movably mounted on the frame, said leg means movable to a first position wherein the seat means faces toward the front wall and movable to a second position wherein the seat means faces away from the front wall, and releasable lock means cooperating with the leg means to selectively hold the leg means in the first position and the second position, said releasable lock means including upright means fixed at one end and having a portion located adjacent the leg means at its other end, pin means secured to the leg means, said pin means engageable with the upright means to hold the leg means is fixed positions when the leg means are in the first position and

second position, and means to bend the other end of the upright means out of engagement with the pin means whereby

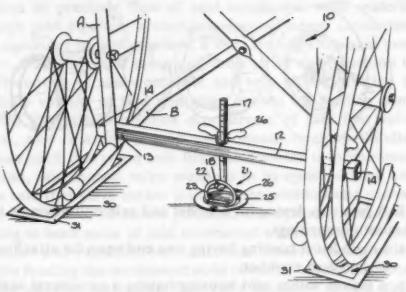


the leg means can be moved from the first position to the second position and from the second position to the first position.

3,955,847
WHEELCHAIR HOLD DOWN ASSEMBLY

Morton I. Schiowitz, Scarsdale, N.Y., assignor to Medi-Cab Inc. of New York, Yonkers, N.Y.

Filed Feb. 3, 1975, Ser. No. 546,545
Int. Cl.² B60N 1/02; B60P 7/08; B61D 45/00; B62B 11/00
U.S. Cl. 296—65 R **7 Claims**



1. An arrangement for safely securing a wheeled patient carrier such as a wheelchair against relative motion within a vehicle having an independent hold down assembly, comprising an independent bar member for normally horizontally engaging spaced side frame structure of a wheeled patient carrier at opposite end portions of said bar member, a stud member arranged substantially along the perpendicular bisector of said bar member, a hook element formed by a bent lower part of said stud member and an eye element cooperating with said hook element wherein said eye element is adapted to be secured permanently to a vehicle floor and said bar and stud members are portable, and means for locking said stud member in a restraining position.

5. In combination, a vehicle and an occupied wheeled patient carrier carried within the vehicle, a floor of said vehicle having a pair of trough-like members receiving the lower parts of wheels of said patient carrier, an independent bar extending horizontally between frame structure of opposite sides of said patient carrier, and means for releasably and removably locking said bar in restrained position to an eye in the vehicle floor.

7. A device for securing a wheeled patient carrier having transverse spaced wheels and frame members such as a wheelchair to a vehicle floor comprising an independent elongated bar having a length greater than the distance between said wheels and frame members of a wheeled patient carrier to be secured, means defining a hole extending perpendicularly through the center of said bar, a stud having threads at one end portion and a return bend at its opposite end portion, said stud passing through said hole, a nut threaded on the threads of said stud, and a loop for engaging said return bend, said bar and stud being portable and said loop being adapted for permanent attachment to a vehicle floor.

3,955,848
AUTOMOBILE ROOF WITH PIVOTABLE VENT PANEL

Alfons Lutz, Emmering, and Horst Bienert, Gauting, both of Germany, assignors to Webasto-Werk W. Baier KG, Stockdorf near Munich, Germany

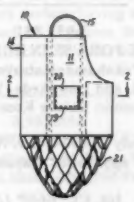
Filed June 19, 1974, Ser. No. 481,358
Claims priority, application Germany, June 20, 1973, 2331329
Int. Cl.² B60J 7/00
U.S. Cl. 296—137 B **5 Claims**

1. In an automobile roof structure having therein a generally rectangular roof opening defining forward and rearward transverse edges, a movable rigid vent panel having a contour conforming to that of said roof opening and receivable within the same for substantially flush registration with the surface of the roof, a frame comprising a wall portion fixed with the under surface of said roof and depending therefrom parallel with, forwardly of, and contiguous to, said forward transverse edge, said wall portion having first and second slots spaced therealong and aligned parallel with said forward edge, first and second tongues secured to and projecting forwardly from said panel, for sliding projection in and through said first and second slots, respectively, to thereby enable pivoting of said panel from a first position essentially flush with the roof, to a second position with its rearward edge elevated above the roof, linkage means including a detachable pivot connection with said panel, adjacent said rearward edge, and operable to hold said panel in said second position, said panel in second position being removable from said roof, when said pivot connection is detached, by rearward translation to withdraw each tongue from its slot.

3,955,849
BEACH CHAIR

Mark Grebow; Janet Grebow, both of 3317 Lauri Road; Leonard E. Albert; Irma Albert, both of 8402 Carlson Lane, all of Baltimore, Md. 21207, and Fred N. Ansel, 3926 Algiers Road, Randallstown, Md. 21133

Filed Dec. 13, 1974, Ser. No. 532,605
Int. Cl.² A47C 4/52
U.S. Cl. 297—183 **1 Claim**



1. A portable, knockdown beach chair, capable of being rolled into a small bundle when not in use, comprising a flexible band, a flexible back rest secured to said band and extend-

ing integrally upwardly therefrom, a pair of upright U-shaped bars forming handle means secured to said band and said back rest and projecting below said band for insertion in the ground to support said band and back rest on the sides thereof, a removable net portion attached to the lower edge of said band, said flexible band being adapted to be filled with sand with said band in contact with the sand of a beach along its lower edge and the back rest extending upwardly therefrom, a seat panel secured to said band at one edge thereof and adapted for covering the sand filling said band to form a seat, and a head rest secured to the inner portion of the upper end of said back rest, said head rest comprising a pouch having a filling opening therein to permit said pouch to be filled with sand.

3,955,850

MODULAR FURNITURE ELEMENTS

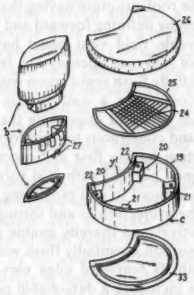
Lorenzo Toso, Strade Cisa n° 221, Bancole, Italy (46047)

Filed Aug. 19, 1974, Ser. No. 498,404

Claims priority, application Italy, Aug. 23, 1973, 46876/73; Jan. 11, 1974, 46802/74

Int. Cl.² A47C 7/00

U.S. Cl. 297—440 **10 Claims**



1. A group of modular furniture elements which can be assembled to form an article of room furniture, comprising:

a. at least one first element which has a shape, in plan, defined by a convex substantially semicircular side of radius R and two converging concave sides extending from opposite ends of said convex side and merging together in a common edge, each of said concave sides being substantially one quarter of the circumference of a circle of radius R, and

b. at least one second element which has a shape, in plan, defined by two interconnecting convex sides, each of which is substantially one quarter of the circumference of a circle of radius R.

3,955,851

STOPPER DEVICE FOR USE IN DUMP TRUCK'S VESSEL

Haruhiko Umeda, Yokohama; Katsuyoshi Mori, Tokyo; Kyozo Sendai, Kawasaki, and Isao Ikeda, Yokohama, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

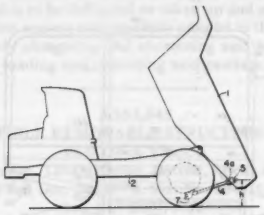
Filed July 8, 1974, Ser. No. 486,470

Claims priority, application Japan, Sept. 28, 1973, 48-112406[U]

Int. Cl.² B60P 1/04

U.S. Cl. 214—17 R **3 Claims**

1. In combination, a vessel tiltably mounted on a dump truck and a stopper device comprising a wire rope coupled to the rear end portion of the vessel, said rope having a ring formed at the free end thereof, and a retaining means projecting from a rear axle housing on said truck, said retaining means engaging said ring to tension said rope and thereby hold



said vessel in a fully tilted position, said rope preventing said vessel from moving from said fully tilted position.

3,955,852

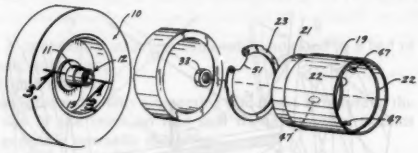
TRAILER HUB CAP DEVICE

Frank A. De Puydt, and Eugene P. Conradi, both of Des Moines, Iowa, assignors to Dico Company, Inc., Des Moines, Iowa

Filed Feb. 10, 1975, Ser. No. 548,349

Int. Cl.² B60B 27/00

U.S. Cl. 301—108 R **2 Claims**



1. A hub cap device for a wheel and axle unit having a hub member comprising:

a. a cylindrical housing having one end open for attachment to said hub member;

b. a piston within said housing having a peripheral sealing means in sealing engagement with the inner peripheral surface of said housing;

c. means for limiting the movement of said piston axially of said housing between a first inner position and a second outer position therefor, including a pair of projections axially spaced on the inner peripheral surface of said housing,

d. means for filling said hub member with grease under pressure,

e. means for yieldably urging said piston toward the inner position therefor to apply a positive pressure on the grease in said hub member,

f. means for bleeding grease from said hub member when the piston is in the outer position therefor,

g. manually operated means for adjusting the effective action of said yieldable means on said piston, adjustable to a first position wherein said yieldable means has a maximum effective action for urging said piston toward the inner position therefor and to a second position wherein the yieldable means is rendered ineffective to urge the piston toward said inner position therefor, and

h. coacting guide means on said piston and on one of said projections for holding said piston against rotational movement within said housing,

i. said piston, manually operated means, and yieldable means, when the yieldable means is in the second position therefor, being freely movable together as a unit axially of said housing between the inner and outer positions for said piston.

3,955,853

SELF-CONTAINED DEVICE FOR THE PNEUMATIC CONVEYANCE OF INCOHERENT SOLID MATERIALS WITH A MODULAR TAKEUP DEVICE AND VALVE MEANS

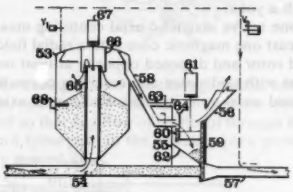
Otto Rusterholz, Via G. A. Borgese 14, Milan, Italy

Filed Nov. 7, 1974, Ser. No. 521,810

Claims priority, application Italy, Nov. 15, 1973, 31322/73; Oct. 29, 1974, 28894/74

Int. Cl.² B65G *53/58*

U.S. Cl. 302—17 **14 Claims**



1. An apparatus for pneumatically conveying incoherent solid material along a pipeline by pulses of compressed gas, comprising means for intermittently feeding said incoherent solid material to said pipeline, a first valve means on said pipeline operable between an open position providing flow of incoherent solid material through said pipeline and to a closed position to preclude flow of said incoherent solid material through said pipeline, a container having means connecting said container to said pipeline, a vent leading from said container, a second valve means movable to an open position to effect venting of said container and to a closed position to preclude venting of said container, means for feeding compressed gas to said pipeline downstream of said first valve means, said first and second valve means opening simultaneously such that when said first valve means is in its closed position, said second valve means is in its open position and when said first valve means is in its open position said second valve means is in its closed position, and operable means for feeding at least some of said incoherent solid material to said container when said first valve means is in said closed position and for feeding the incoherent solid material in said container to said pipeline when said first valve means is in said open position.

3,955,854

ELECTRONIC CONTROL UNIT FOR AN ANTISKID BRAKE SYSTEM OF A VEHICLE

Guy Marouby, Neuilly, France, assignor to Societe Anonyme D.B.A., Paris, France

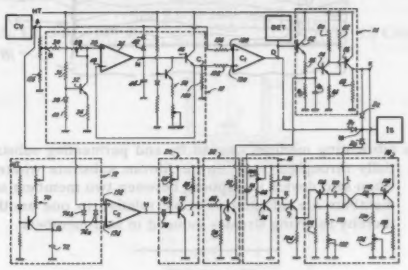
Filed Feb. 19, 1975, Ser. No. 551,176

Claims priority, application France, Mar. 6, 1974, 74.07557

Int. Cl.² B60T *8/10*

U.S. Cl. 303—21 BE **10 Claims**

1. An electronic control unit for an anti-skid brake system of a vehicle, of the three-phase-type, comprising a modulating device including a solenoid isolation valve and a solenoid relief valve adapted to be mounted between a set of brake actuators in the vehicle, and a source of brake pressure, the control unit further comprising means for generating a first signal representative of the speed of at least one wheel of a vehicle, means responsive to the value of the first signal for generating a speed reference signal, first comparing means for comparing said first signal with said speed reference signal and for generating a third signal when a predetermined condition relating to the comparison of said first signal and said speed reference signal is fulfilled, control means for energizing said isolation and relief valves in response to generation of said third signal, means for generating a fourth signal, said fourth signal tending to increase linearly with time, second comparing means of which one input receives the first signal and the other input receives the fourth signal, said second comparing means generating a fifth signal when a predetermined condition between the first and fourth signals is fulfilled, a voltage limiting device being inserted between the two inputs of the second comparing means, said control means including a



monostable isolation device for generating a sixth signal on appearance of the third signal, said sixth signal being fed to the input of an isolation amplifier controlling actuation of the isolation valve, a discharge switching means being responsive to termination of the fifth signal for terminating the sixth signal.

3,955,855

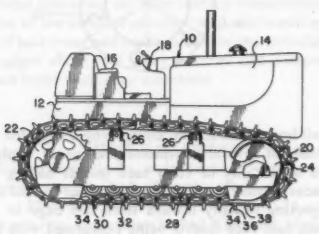
WEAR-RESISTANT COMPOSITE TRACK LINK

Charles G. Massicon, and Chris Robert Straesser, both of East Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 17, 1975, Ser. No. 568,951

Int. Cl.² B62M *27/02*; B62D *55/24*

U.S. Cl. 305—38 **9 Claims**



1. In a vehicle having a track made up of a plurality of interconnected links, roller means on said vehicle over which said links of said track pass, a contact surface on each of said links engaging with said roller means as said links pass said roller means, said contact surface having a bar of hard wear-resistant material bonded in a groove formed in said link whereby said contact surface will resist wearing away due to said contact with said roller means.

3,955,856

ANTI-FRICTION DEVICE

Andrew J. Wayson, Needham, and James Moy, Norwell, both of Mass., assignors to Litton Industrial Products, Inc., Hingham, Mass.

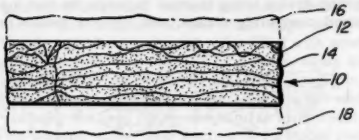
Filed Mar. 5, 1975, Ser. No. 555,580

Int. Cl.² F16C *17/00*

U.S. Cl. 308—3 R **20 Claims**

1. An anti-friction device adapted to be disposed between two load bearing members comprising;

a fibrous, non-metallic substrate, fabricated from a material capable of withstanding hostile conditions,



a lubricating medium carried by and permeating substantially throughout said entire fibrous substrate whereby when said device is disposed between two members said members are adapted to move relative to one another thereby relieving stresses induced in said members.

3,955,857

BALL BOX

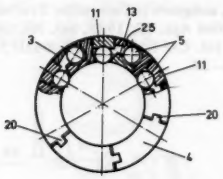
Rainer Schurger, Schwanfeld; Lothar Walter, Schweinfurt, and Erich Burkl, Stammheim, all of Germany, assignors to SKF Industrial Trading and Development Company, B.V., Jutphaas, Netherlands

Filed Dec. 6, 1974, Ser. No. 530,382

Claims priority, application Germany, Jan. 11, 1974, 2401225

Int. Cl.² F16C *17/00*

U.S. Cl. 308—6 C **11 Claims**



1. A ball box construction, comprising a cage for the guidance of balls of several continuous ball races, a plurality of balls, and a plurality of steel race inserts having first and second races formed therein and assembled in said cage, said balls projecting radially inward from the cage in the zone under load, said race inserts being positioned with their first races radially outward of the balls in the zone under load, whereby said balls roll on said first races of said steel race inserts in an axial direction, each race in the zone under load being connected to a return channel in the load-free zone of the cage by reversing zones, each return channel being defined in a radially inward direction by a second race of a race insert, said race inserts comprising steel clips having connecting pieces at one face inter-connecting the respective first and second races.

3,955,858

SATELLITE MOMENTUM WHEEL

Pierre Poubeau, Le Pecq, France, assignor to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Dec. 31, 1974, Ser. No. 537,835

Claims priority, application France, Jan. 3, 1974, 74.00190; Dec. 10, 1974, 74.40556

Int. Cl.² F16C *39/00*

U.S. Cl. 308—10 **14 Claims**

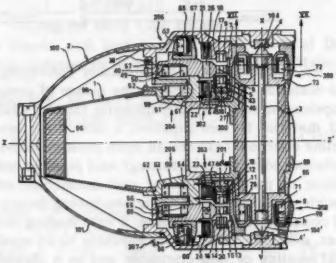
1. A magnetically suspended momentum wheel for satellites, including a stator within which are disposed:

a rotor having a rotation shaft with back-up anti-friction bearings capable of selectively bearing against associated safety abutment means;

a sensor for sensing the axial velocity and a sensor for sensing the axial position of said rotor in relation to said stator;

at least one passive magnetic radial centering means formed by at least two coaxial magnet cores with alternating axial magnetic fields that are mounted on said rotor and are included, on either side, between two coaxial magnetic cores rigidly connected to said stator and the complementary axial magnetic field of which closes upon said stator through a yoke;

at least one active magnetic axial centering means formed by at least one magnetic core with a radial field mounted on said rotor and disposed opposite at least one circular coil fast with said stator and receiving correction signals from said axial velocity sensor and said axial position sensor;



at least one damping means at one end of said rotor and formed by a conducting disc connected to said stator and included between toroidal magnets angularly rigid with said rotor;

at least one switchable motor-generator formed by at least one alternatingly magnetized magnetic core connected to said rotor and included, on either side, between windings connected to said stator and wound over a ferromagnetic toroidal core;

whereby those turns of said windings which lie in the air gap engender either electromagnetic forces enabling said magnetic core to rotate through successively switched activation of said toroidal windings subjected one after the other to the same continuous magnetic field, and a unidirectional induced current when said magnetic core is continuously rotated and said toroidal windings are switched in succession after being subjected one after the other to the same continuous magnetic field.

3,955,859

BEARING WITH MULTIPLE LIP SEAL

Leo Stella, Bristol, and Cameron Gualco Gardella, Woodbury, both of Conn., assignors to The Torrington Company, Torrington, Conn.

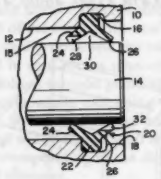
Filed Mar. 25, 1975, Ser. No. 561,859

Int. Cl.² F16C *33/76, 33/80*

U.S. Cl. 308—36.1 **20 Claims**

1. A bearing comprising: a housing with an axial bore, a rotatable shaft mounted in said housing and having a diameter less than the diameter of said axial bore in the housing to provide an annular space between said housing and said shaft for containment of lubricant; and an annular seal in said annular space including an annular main body portion, an annular inner lip, and at least one other annular lip axially spaced from the inner lip, said inner lip and said at least one other annular lip each having at least one opening, the opening in the inner lip extending from the annular space containing the lubricant

through the inner lip and into the annular space provided by the said two axially spaced lips; the opening in said at least one other annular lip being circumferentially spaced from the opening in the inner lip and extending from the annular space



between the axially spaced lips through said at least one other annular lip, said inner lip and said at least one other lip being constructed so that any flow of lubricant through the openings will follow a torus path in the annular space provided by the two axially spaced lips.

3,955,860

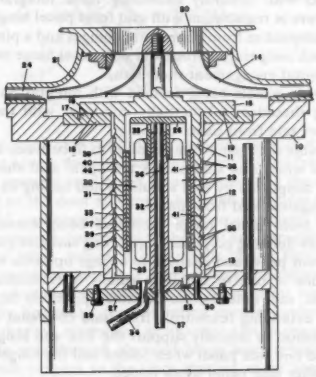
JOURNAL BEARING

John R. Menke, and Gilbert F. Boeker, both of New York, N.Y., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Feb. 7, 1949, Ser. No. 75,067

Int. Cl.² F16C *1/24*

U.S. Cl. 308—134.1 **5 Claims**



1. An improved journal bearing comprising in combination a non-rotatable cylindrical bearing member having a first bearing surface, a rotatable cylindrical bearing member having a confronting second bearing surface having a plurality of bearing elements, a source of lubricant adjacent said bearing elements for supplying lubricant thereto, each bearing element consisting of a pair of elongated relatively shallowly depressed surfaces lying in a cylindrical surface co-axial with the non-depressed surface and diverging from one another in the direction of rotation and obliquely arranged with respect to the axis of rotation of said rotatable member to cause a flow of lubricant longitudinally along said depressed surfaces from their distal ends toward their proximal ends as said bearing members are rotated relative to one another, each depressed surface subtending a radial angle of less than 360°, and means for rotating said rotatable bearing member to cause the lubricant to flow across and along said depressed surfaces, the flow of lubricant being impeded by the non-depressed portions of said second bearing surface to cause an increase in the lubricant pressure.

3,955,861

OSCILLATING BEARING SUPPORTS

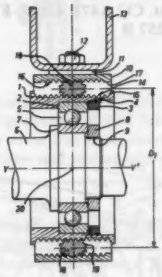
Michel Orain, Conflans-Sainte-Honorine, France, assignor to Societe Anonyme dite: Glaenzer Spicer, Poissy, France

Filed Oct. 18, 1974, Ser. No. 515,920

Claims priority, application France, Dec. 26, 1973, 73.46343

Int. Cl.² F16C *13/00*

U.S. Cl. 308—189 R **12 Claims**



1. An oscillating bearing support for supporting an intermediate shaft of a power transmission including universal joints, comprising an inner member supporting the intermediate shaft for rotation and having an outer substantially cylindrical surface, an outer member having a substantially cylindrical internal bore receiving said inner member with the freedom necessary to allow oscillating movement of said outer member, adjacent circular grooves on the outer surface of said inner member and along the internal bore of said outer member, all of said grooves being substantially the same size and extending transversely of the axes of the outer surface and the bore, and a toroidal member of elastic material having adjacent circular ribs along its outer surface concentrically of the center line of the toroidal member, said ribs meshing with the grooves of said inner and outer members, the toroidal member being engages about said inner member and compressed between said inner and outer members.

3,955,862

THRUST BEARINGS

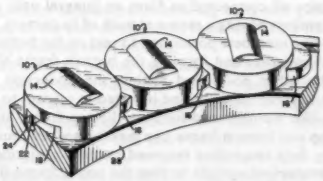
Robert Stanley Batt, Barby, near Rugby, England, assignor to The Torrington Co., Ltd., Coventry, England

Filed Mar. 4, 1975, Ser. No. 555,124

Claims priority, application United Kingdom, Mar. 5, 1974, 9745/74

Int. Cl.² F16C *33/38*

U.S. Cl. 308—235 **5 Claims**



1. A thrust bearing cage comprising: a plurality of rolling member carriers arranged in circular side-by-side relationship, each carrier having an enclosed rolling member pocket; said carrier also having a single tab extending from one side and a circumferentially opposed recess; the tabs of each carrier extending into the recess of an adjacent carrier and fixedly

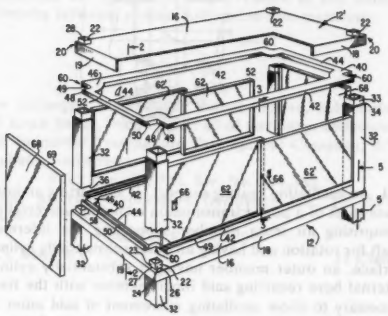
connected to said adjacent carrier in a manner to prevent relative or pivotal movement of the carriers.

3,955,863

MEANS FOR CONVERTING AN OPEN-SHELVED UNIT OR ETAGERE TO A CLOSED CABINET WITH SLIDABLE CLOSURE PANELS

Bernard Yellin, 5252 S. Kolmar Ave., Chicago, Ill. 60632

Filed Nov. 7, 1974, Ser. No. 521,683
Int. Cl.² A47B *43/00*; F16B *12/00*
U.S. Cl. 312—257 R 8 Claims



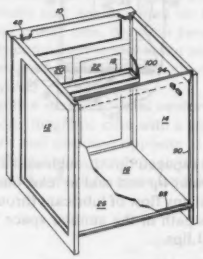
1. Means for converting an open-shelved unit to a closed cabinet with closure panels, with said open-shelved unit comprising a bottom horizontal wall member, a top horizontal wall member, each said horizontal wall member having a downwardly facing socket and an upwardly extending member adjacent the corners thereof for detachably receiving a tubular upright whereby the upper end of said uprights are interfitted with the downwardly facing socket of the top horizontal wall member and the upwardly extending members of the bottom horizontal wall member are interfitted with the bottom of the tubular upright adjacent said corners to thereby space said top and bottom horizontal wall members and connect same without the use of extraneous fastening elements, the upper end of said uprights having a shoulder; the means for converting said open-shelved unit to a closed cabinet comprising a pair of frame-like members, each said frame-like member comprising a pair of spaced side strips and a pair of spaced end strips all connected to form an integral unit, said frame-like members having a recess at each of its corners, one of said frame-like members positioned to rest on the bottom horizontal wall member and forming the bottom frame-like member and the other positioned against the underside of the top horizontal wall member and inverted in respect to the bottom frame-like member and forming the top frame-like member, said top and bottom frame-like members when thus positioned having their respective recessed corners positioned adjacent each respective upright so that the upper frame-like member rests on the shoulder at the upper end of said upright to secure said upper frame-like member in locked position relative to said uprights and with said bottom frame-like member retained in position relative to said uprights, said side strips of said frame-like members having a pair of side channels and said end strips each having an end channel, a closure panel slidably received in said side channels and a closure panel received in said end channels.

3,955,864

MOLDED FOLDABLE CABINET

Kenneth A. MacDonald, 251 York St., Canton, and Edward J. MacDonald, 180 Border St., Scituate, both of Mass.

Filed Mar. 21, 1974, Ser. No. 453,331
Int. Cl.² A47B *43/00*, *46/00*, *47/04*, *88/18*
U.S. Cl. 312—258 4 Claims



1. A foldable cabinet, comprising
a. a front panel formed with a rectangular opening therethrough,
b. at least one door hinged to said front panel across said opening,
c. rearwardly extending fixed hinge members formed integral with said front panel adjacent each side thereof,
d. a side panel hinged on each side of said front panel and formed with inwardly extending fixed integral hinge members in registration with said front panel hinge members adapted to form cooperating hinges and a pin engaging each cooperating front and side panel hinge members for pivotal engagement therewith,
e. said side panels being formed with integral oppositely facing shoulders substantially co-planar with the lower edge of said front panel opening,
f. a movable shelf panel dimensioned to fit between said side panels when said side panels are open, said shelf panel being supported by said shoulders and having its leading edge against said front panel,
g. said front panel hinge members being formed with notches defining co-planar supporting surfaces parallel to the front panel and adapted to engage opposite marginal portions of one of said side panels when folded thereagainst, said notches also defining oppositely facing surfaces extending rearwardly from said co-planar surfaces in position to laterally support the free and hinged ends of said one side panel when folded and the hinged end of the other side panel when folded.

4. A foldable cabinet, comprising
a. a front panel formed with a rectangular opening therethrough,
b. at least one door hinged to said front panel across said opening,
c. rearwardly extending hinge members on said front panel adjacent each side thereof,
d. a side panel connected to said hinge members along each side of said front panel whereby said side panels may be folded in overlapping relationship against said front panel,
e. a movable full shelf panel dimensioned to fit between said side panels when open and extending to the rear edges thereof,
f. means supporting said shelf panels to said side panels when open,
g. said side panels being formed with matching curved grooves extending each in an arcuate path from the forward edge thereof in an arc of substantially 90° inwardly and downwardly along the inner face of said panel, said front panel being formed with a first pair of recesses along

the hinge sides thereof adjacent said opening and substantially in the same plane as the lower inner end of said grooves and a second pair of recesses along the hinge sides thereof adjacent the top of said groove, and,

h. a rectangular tray formed with spaced parallel lugs, extending from each corner thereof and defining a pair of lugs at each end of said tray with one lug of each pair of lugs mounted in said groove and the other lug of each pair of lugs mounted in said recess whereby said tray may be pivoted from a folded upright position when said cabinet is folded to a horizontally extending position when said cabinet is open, the width of said tray generally corresponding with the width of said shelf and the depth of said tray generally corresponding to the distance between said first and second recesses.

3,955,865

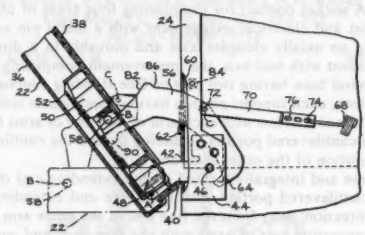
OVEN DOOR COUNTERBALANCE SYSTEM

Arthur C. Wilson, 108 Ashland Ave., Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Nov. 4, 1974, Ser. No. 520,722

Int. Cl.² F23M *7/00*; **A47B** *88/00*

U.S. Cl. 312—319 **6 Claims**



1. An appliance comprising an outer cabinet with a front-opening access door, the cabinet having a front frame forming a door opening, and hinge means connecting the door to the cabinet so the door may move between a vertical closed position and a generally horizontal open oposition, hinge lever means pivotally connected to the door and generally overlying the said hinge means, a slot means in the front frame for accommodating the hinge lever means therethrough, a link means pivotally connected to the hinge lever means, and a generally horizontal tension spring means connected at one end to the link means and at its other end to the said cabinet near the rear thereof, the said hinge lever means becoming fixed with respect to the door starting at an angle between about 20° and 35° and continuing until the door reaches the horizontal fully open position, said link means being attached to the said hinge lever means at a point outwardly of the door frame when the door is in its fully open position whereby the weight of the door is substantially balanced throughout its entire range of door movement.

3,955,866

METHOD OF MANUFACTURING A FLASH LAMP

Johannes Cornelis Antonie Vreeswijk, and Henricus Petrus Wilhelmus Wolffensperger, both of Terneuzen, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

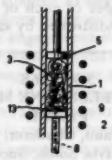
Filed Aug. 9, 1974, Ser. No. 496,180

Claims priority, application Netherlands, Aug. 28, 1973, 7311779

Int. Cl.² H01J *9/385*

U.S. Cl. 316—20 **9 Claims**

1. A method of manufacturing a flash lamp having an envelope filled with thin strips of intertwined combustible material which comprises: providing a chamber and a reciprocally mounted first die having a peripheral face dimensioned and configured for snug fitting engagement within said chamber during reciprocation of said first die; introducing a quantity of intertwined elongated pieces of combustible material into said



chamber; compressing said quantity of material to the shape of said chamber by reciprocation of said first die; annealing the shaped material to a stress-free state; inserting said shaped material into said envelope; and sealing said envelope.

3,955,867

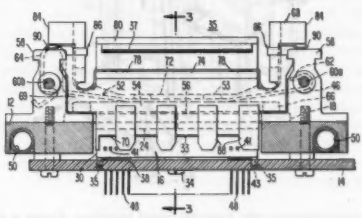
INTEGRATED CIRCUIT PACKAGE CONNECTOR WITH PROBING FACILITY

Robert E. Braun, Norristown, and George J. Sprenkle, Phoenixville, both of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Oct. 9, 1974, Ser. No. 513,278

Int. Cl.² H01K *1/12*

U.S. Cl. 339—17 CF **10 Claims**



1. A connector assembly for mounting an integrated circuit package comprising:

a body member of electrically insulative material having two of its sides oriented longitudinally, said body member having internal substantially rectangular slotted sections disposed in planes parallel respectively to said sides,

pluralities of electrical contact elements positioned in spaced apart longitudinal relation along respective ones of said sides, each of said contact elements having a portion thereof situated along the contour of one of said slotted sections and assuming a general U-shaped configuration comprising one leg integral with the remainder of said contact element, a second leg lying along the inner surface of the side of said body member, and a transverse member joining the two legs,

said body member having external ledge sections extending respectively along said sides and enclosing a portion of said slotted sections, said ledge sections having a plurality of discrete apertures, a plurality of discrete openings in each of the sides of said body member leading from the outside surface thereof to said internal slotted sections, each ledge aperture having a corresponding side opening, both said ledge apertures and side openings being spaced apart in homologous relationship with the portions of said contact elements situated in said slotted sections, each of said transverse members of said U-shaped portions of the contact elements lying below one of said ledge apertures, each of said second legs of said portions of the contact elements including a tab-like projection for engaging the material surrounding said side opening and rendering said

U-shaped portion of said contact element immobile within said slotted section,

the electrical probing of said contact elements being permitted by way of said ledge apertures and the transverse members of said U-shaped portions of the contact elements, the remainder of each of said contact elements being physically undisturbed by said probing.

3,955,868

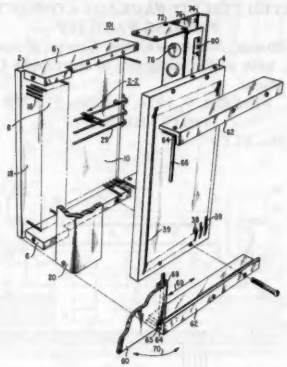
CONNECTOR FOR TELEPHONE MAIN DISTRIBUTING FRAME

Wilfred Julius Kindermann, Chatham; Lawrence Miles Slavin, Rockaway; Robert Alvin Soltis, Succasunna, and Ambrose James Vallely, Florham Park, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 18, 1974, Ser. No. 489,579

Int. Cl.² H01R *25/06, 13/44*

U.S. Cl. 339—18 B **1 Claim**



1. A connector for a telephone main distributing frame comprising in combination:

first and second substantially rectangular panels each having first and second sides and mounted in spaced relation to each other to define a space between said first sides;

a first array of female pin-grip terminals mounted in a first section of said first panel and adapted to receive pluggable electrical protector modules therein, a first group of said terminals having first ends extending from said first side of said first panel into said space to be accessible for making connections thereto within said space, a second group of said terminals having first ends extending from said first side of said first panel through said space and said second panel to be accessible for making connections thereto on said second side of said second panel;

a second array of test terminals mounted in a second section of said first panel and having first ends extending from said first side of said first panel whereby connections to said test terminals and said first group of pin-grip terminals can be made within said space and protected therein by said panels;

first and second brackets mounted on said second side of said second panel, each of said brackets including a channel therein,

a rod member disposed between respective opposing ends of said brackets, and

a cover slideably mounted in said channels, said cover including a lip member for engaging said rod to provide a stop and pivot for said cover when said cover is moved to provide access to said first ends of said second group of terminals.

3,955,869

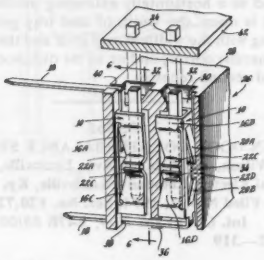
ELECTRICAL SOCKET AND SOCKET CONTACT ADAPTED FOR USE THEREWITH

Harry Licht, Neckarsulm, Germany, assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 336,929, March 1, 1973, abandoned. This application Aug. 2, 1974, Ser. No. 494,208

Int. Cl.² H01R *27/00, 11/22*

U.S. Cl. 339—32 R **3 Claims**



1. A socket contact for establishing four areas of physical support and electrical engagement with a metal pin contact having an axially elongate axis and movable in a direction coincident with said axis, the improvement comprising:

a metal base having two pair of free standing support portions, each support portion having a spring arm integrally formed thereon with each arm of said pair of arms having a cantilevered portion extending toward the cantilevered portion of the other arm; and

a free and integrally formed on the extending end of each cantilevered portion with each free end extending in a direction away from the free end of the other arm of the respective pair of arms with the free ends and cantilevered portions of each pair of arms forming axially spaced aligned guideways for said pin contact to guide the receipt of said pin contact from either of two directions coincident with said axis and each pair of arms engaging said pin contact at a respective pair of positions spaced axially of said pin contact and providing two areas of physical support and electrical engagement with said pin contact for each pair of arms.

3,955,870

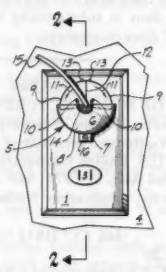
UTILITY OUTLET GUARD

Saul Z. Wasserman, Brooklyn, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Aug. 21, 1975, Ser. No. 606,552

Int. Cl.² H01R *13/44*

U.S. Cl. 339—39 **8 Claims**



1. A safety enclosure comprising a hollow semi-sphere having a lateral chordal fastening surface affixed parallel and

adjacent to a free edge thereof, said lateral chordal surface being fastened to a cover plate of an electrical utility outlet, said semi-sphere in combination with two access panels each having biasing means tending to force said panels into closed position providing minimal access to the interior of said hollow semi-sphere, said access panels having surfaces which rotate about a line into an open position confining said access panels within a portion of said hollow semi-sphere which is stationary and affixed to said cover plate when manual opposing forces in opposition to the force established by said biasing means are exerted upon said access panels, said line normal to a first plane formed by the exterior lateral surface of said cover plate passing through the center of said utility outlet and through the apex of said hollow semi-sphere, said access panels adapted to engage each other having their engaging edges lying in a second plane normal to said first plane, said line lying in said second plane, an open ended slot formed in the portion of said semi-sphere which is fastened to said cover plate, said slot centered about said line, said access panels having parallel edges to said first plane, said parallel edges free of touching engagement with said first plane.

3,955,871

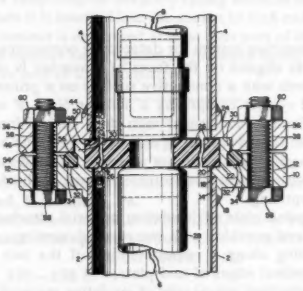
CONNECTING MEANS FOR RADIO FREQUENCY TRANSMISSION LINE

Jack L. Kruger, P.O. Box 215, Goffstown, N.H. 03045

Filed Mar. 18, 1974, Ser. No. 452,332

Int. Cl.² H01R *13/54*

U.S. Cl. 339—92 R **3 Claims**



1. Means for connecting together the outer uniform diameter tubular sections of a radio frequency transmission line and for supporting an inner tubular conductor in spaced relation therewithin, said means comprising a first circular flange connected to the end of one outer tubular section and a second circular flange connected to the adjacent end of the next outer tubular section, both flanges having a plurality of bolt holes therethrough spaced radially and angularly for mutual alignment, a circular groove in the face of said first flange, a circular wall extending above the face of said first flange, the outer circular face of said wall defining an extension of the inner circular wall of said groove, said outer circular face being of greater diameter than the said inner circular wall of said groove, the inner circular face of said wall defining a short cylindrical surface of greater diameter than the interior diameter of said tubular sections, a circular shoulder at one end of said short cylindrical surface, a circular spacer located within said short cylindrical surface and supported by said circular shoulder, an inner tubular conductor carried by said spacer in radially spaced relation to said first and second flanges and said tubular section, an O-ring in said groove with part of said O-ring extending above the face of said first flange, said second flange having a recess about its interior periphery defined by an annular surface adapted to engage the end of said raised circular wall and by a cylindrical surface extending from the said annular surface to the face of said second flange, said last named cylindrical surface sized to closely surround the outer circular face of said wall and having an axial dimension less than the distance from the end of said raised circular wall to the face of said first flange, the inner part of the annular face of said second flange adapted to engage the exposed part of said O-ring, the dimensions being such that when said annular face of the recess is in engagement with the end of said wall, said O-ring will be compressed by the inner part of the annular face of said second flange to create a seal between said first and second flanges, said second flange having a circular interior part which extends radially inward far enough to overlie the periphery of said spacer thereby to anchor said spacer in position between said flanges, both said flanges having interior circular recesses in which reside the ends of said adjacent tubular outer sections.

3,955,872

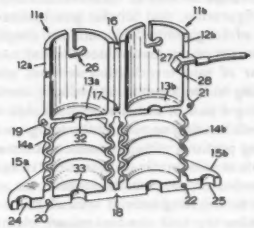
SHOCK RESISTANT LAMP SUPPORT

Peter E. Brudy, Willowdale, Canada, assignor to Dominion Auto Accessories Limited, Toronto, Canada

Continuation-in-part of Ser. No. 348,120, April 5, 1973, abandoned. This application Mar. 26, 1974, Ser. No. 454,914

Int. Cl.² H01R *33/12*

U.S. Cl. 339—93 L **17 Claims**



1. In a shock resistant lamp support, the combination comprising

two plastic parts,

each of said parts comprising an upper semi-cylindrical socket forming portion,

an intermediate integral flexible portion extending from said socket forming portion,

said flexible portion having at least a part thereof of thin cross section to provide an area of flexibility,

and an integral lower thickened base portion,

integral hinge means between said two parts whereby said parts can be brought into abutting relation to define a cylindrical socket,

said intermediate flexible portion extending between said socket forming portion and said base portion,

a transverse wall in each said socket forming portion separating said socket forming portion from said intermediate portion.

3,955,873

ELECTRICAL CONNECTOR AND CONTACTS THEREFOR

Carl W. Peterson, Santa Ana, Calif., assignor to International Telephone & Telegraph Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 510,382, Sept. 30, 1974, abandoned. This application Nov. 27, 1974, Ser. No. 527,600

Int. Cl.² H01R *13/38*

U.S. Cl. 339—99 R **21 Claims**

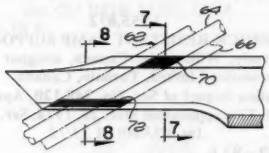
1. An electrical connector adapted to be connected to the ends of a plurality of conductors each covered by insulation comprising:

an insulative housing having a first section and a second section;

said first housing section having a conductor receiving side and a mating side, said second housing section being removably mounted on the conductor receiving side of said first housing section;

a plurality of contact receiving cavities in said first housing section extending from said conductor receiving side to said mating side, said cavities being arranged in a predetermined pattern in spaced parallel relationship to each other;

contacts mounted in said cavities, each said contact having a forward contacting portion on said mating side and a rear termination section on said conductor receiving side;



said termination section of each said contact having a tubular configuration, said tubular termination section having a pair of longitudinally extending conductor receiving slots therein on opposite sides thereof each extending to the rear of said termination section, one of said slots extending to the forward end of said termination section providing a pair of arcuate resilient side walls;

said second housing section embodying means for forcibly inserting portions of said conductors simultaneously into said slots in said termination sections of said contacts with said conductor portions disposed at an acute angle with respect to the longitudinal axes of said termination sections, whereby said conductors are electrically and mechanically connected to said contacts.

3,955,874

SHIELDED POWER CABLE SEPARABLE CONNECTOR MODULE HAVING A CONDUCTIVELY COATED INSULATING ROD FOLLOWER

Vincent J. Boliver, Pittsfield, Mass., assignor to General Electric Company, N.Y.

Filed Oct. 29, 1974, Ser. No. 518,179
Int. Cl.² H01R *13/52*
U.S. Cl. 339—111 **7 Claims**

1. A rod connector module for separably connecting shielded electrical power cable, comprising:

an insulating housing containing a contact rod support;

a contact rod assembly, including a metal contact rod to be received by a bore contact, said rod being fixed at one end to said support;

an insulating arc follower fixed to said rod at its other end for insertion into the bore, and

an insulating mounting pin extending from the end of said rod along at least a portion of the interior of said follower, wherein the improvement comprises,

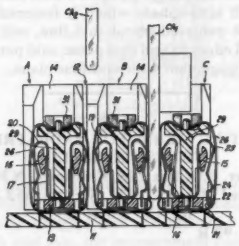
an electrically conductive coating on said pin and in electrical contact with said rod.

3,955,875

CONNECTOR

Gerard Petiot, Champigny-sur-Marne, France, assignor to Compagnie Honeywell Bull (Societe Anonyme), Paris, France

Filed Nov. 19, 1974, Ser. No. 525,283
Claims priority, application France, Nov. 22, 1973, 73.41641
Int. Cl.² H05K *1/07*
U.S. Cl. 339—176 MP **8 Claims**



1. A connecting system for detachably connecting conductive surfaces aligned on the faces of a number N of printed circuit boards with a conductive surface on a printed circuit panel, said system comprising a number N+1 of connector elements fixed to said panel with their central longitudinal axes parallel to and spaced at a distance from one another in order to permit the insertion of an edge of one of said boards between two adjacent connector elements, each of said elements comprising:

an elongated plate of insulating material attached to said panel and provided with two rows of openings, each row extending along a respective one of the two opposite longitudinal edges of said plate,

two longitudinal lateral rails of insulating material attached by their ends to said plate and disposed at the same level, each above a respective one of said rows of openings,

a set of generally U shaped spring strips disposed between said rails and joined together by a longitudinal center strip fixed on said plate, each spring strip being provided at each of its ends with at least one leaf spring which is folded over so that the free end of each leaf spring is at the same level as that of said center strip, each spring strip normally being positioned, in the absence of a circuit board, with a part between each free end and the center strip in contact with a respective one of said rails, each of said leaf spring being provided at its free end with a stem adapted to be moved loosely into a respective one of said openings, said stem being normally in contact with the wall of said opening which is the nearest from the longitudinal edge next to said opening, each leaf spring being further provided with outwardly directed bosses,

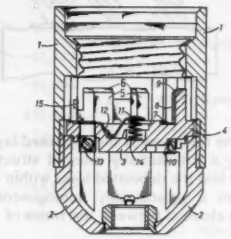
and two series of elongated contact blades carried by a thin sheet of insulating material, each of said blades having one end thereof bonded to a conductive surface on said panel between the latter and an opposed connector plate and having a central portion disposed opposite to an associated one of said leaf springs, whereby said central portion is urged towards a conductive surface on a printed circuit board when the latter is inserted between two adjacent connector elements.

3,955,876

ELECTRIC LAMP SOCKET

Fritz Knüppel, Ludenscheid, Germany, assignor to Vossloh-Werke GmbH, Werdohl, Germany

Filed Feb. 3, 1975, Ser. No. 546,749
Int. Cl.² H01R 17/20
U.S. Cl. 339—176 L 8 Claims



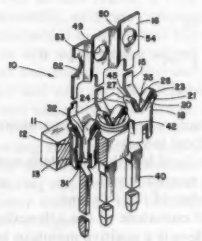
1. An electric lamp socket comprising a housing, a support block in said housing and having spaced apart rigid projections distributed over its periphery and extending parallel to the central longitudinal axis of the socket, a middle contact carried by said support block, said contact being resilient in the direction of the central longitudinal axis of the socket, and at least one rigid side contact in the form of a blade mounted in the socket, said projections being of such height that the base of a lamp rests on inwardly facing surfaces of the projections when it is inserted into the socket to such extent that said middle contact is depressed at least over part of its travel, and said side contact bears against an inwardly facing surface of a respective one of the projections.

3,955,877

LOW PROFILE CONTACT

Robert Franklin Cobaugh, Elizabethtown, and James Ray Coller, Mechanicsburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 451,252, March 14, 1974, abandoned. This application June 23, 1975, Ser. No. 589,092
Int. Cl.² H01R 13/12
U.S. Cl. 339—258 P 3 Claims



1. A circuit board connector for receiving an electrical conductor comprising:

a conductor receiving cylinder for insertion into a hole of the circuit board;

at least a pair of first tabs extending upwardly from opposite sides of the top of said cylinder and with a portion of each tab bent back upon itself to extend partially into said cylinder to engage the inserted electrical conductor; and

a pair of second tabs oppositely positioned between said pair of first tabs, with each second tab being flared outwardly from the axis of said cylinder;

each second tab having a dimple formed therein near the juncture of said each second tab and said cylinder;

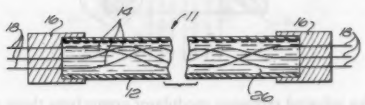
said dimple extending inwardly towards the interior of said cylinder to guide an inserted electrical connector in between the bent back portions of said pair of first tabs.

3,955,878

FIBER OPTIC TRANSMISSION LINE

Gerhard H. Nowak, San Diego, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Feb. 13, 1975, Ser. No. 549,730
Int. Cl.² G02B 5/16
U.S. Cl. 350—96 R 9 Claims



1. A fiber optic transmission line for an optical signal transmitting cable comprising:

a flexible, liquid impermeable tubular member;

a plurality of optical fibers loosely positioned lengthwise in said tubular member;

said fibers having a fiber axis length greater than the length of said tubular member when the latter is in relaxed condition whereby said fibers are essentially free of axial stress when said tubular member is under load, each said fiber being in the form of a helix, said helical fibers having a common axis and substantially equal convolution diameters, the convolutions of said helical fibers being alternately disposed and in spaced relation to each other; and

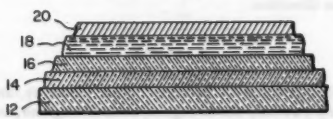
fluid-like gelatinous means substantially filling said tubular member restraining longitudinal and lateral movement of said fibers relative to each other and said tubular member.

3,955,879

NONLINEAR ELECTROCHROMIC DEVICE

Horst Witzke, Princeton, and Matthew D. Miller, Cranbury, both of N.J., assignors to Optel Corporation, Princeton, N.J.

Filed Oct. 25, 1973, Ser. No. 409,580
Int. Cl.² G02F 1/23
U.S. Cl. 350—160 R 3 Claims

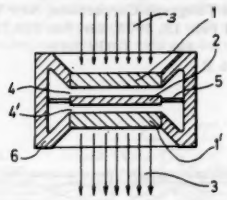


1. An electrochromic device comprising a transparent conductive first electrode selected from the group consisting of tin oxide and indium oxide, a film of an electrochromic oxide on said electrode, an acidic electrolyte layer which is not reactive with said electrochromic film over said electrochromic film, and a lead electrode over said electrolyte layer, said device having an internal EMF which is measured by the color state of the electrochromic layer.

3,955,880
INFRARED RADIATION MODULATOR

Ernst-Günther Lierke, Eschborn, Germany, assignor to Organisation Europeenne de Recherches Spatiales, France

Filed July 15, 1974, Ser. No. 488,469
Claims priority, application Germany, July 20, 1973, 2336930
Int. Cl.² G02F 1/38
U.S. Cl. 350—160 R **13 Claims**



1. An infrared radiation modulator comprising three parallely arranged interferometer plates made of a material having a limited absorption rate in the wavelength region of the radiation to be modulated, said interferometer plates forming two successive interferometric slits therebetween for passing the radiation to be modulated, the two outer plates of said three interferometer plates being stationary, and the central plate being suspended to a flexural resonator such that the width of said slits is periodically varied, the interferometer plates being comprised of monocrystalline doped cadmium telluride (CdTe) having a high resistivity and a limited absorption rate for infrared radiation.

3,955,881
ELECTRO-OPTICAL DEVICE EMPLOYING NEMATIC LIQUID CRYSTAL

Mashachika Yaguchi, Yokohama; Toshio Jinnai, Kamakura; Mikio Shirotsuka, Kamakura, and Kazuo Totani, Kamakura, all of Japan, assignors to Dai Nippon Toryo Kabushiki Kaisha, Osaka, Japan

Filed July 1, 1974, Ser. No. 485,036
Claims priority, application Japan, June 10, 1974, 49-65071
Int. Cl.² G02F 1/13
U.S. Cl. 350—160 LC **10 Claims**

1. A liquid crystal electro-optical element which comprises a pair of electrode plates confronting each other and a thin layer of nematic liquid crystal materials having a positive dielectric anisotropy positioned between the two plates, at least one of the electrode plates being coated on its interior face with a thin layer of cellulose resins selected from the group consisting of nitrocellulose, acetylcellulose, cellulose acetate butyrate, cellulose acetate propionate, methylcellulose, and mixtures thereof, said coated face being rubbed along one direction.

3,955,882
OPTICAL ELEMENTS

Robert George Tomison Neilson, Melton Mowbray, and John Anthony Fawcett, Thrussington, both of England, assignors to The Rank Organisation Limited, Surrey, England

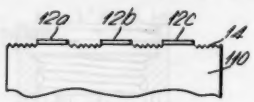
Filed July 19, 1972, Ser. No. 273,292
Claims priority, application United Kingdom, Aug. 9, 1971, 37347/71
Int. Cl.² G02B 1/10
U.S. Cl. 350—164 **7 Claims**

1. An optical element of the type having zones selectively responsive to incident light, comprising

a. a transparent substrate,

b. a layer of material fixedly deposited on said substrate and of a material having selected optical properties differing from those of the substrate, said layer being deposited in a predetermined pattern to define zones selectively responsive to incident light, and said layer having a thickness not substantially exceeding 10 micro-meters,

c. a coating applied directly onto said substrate and the layer deposited thereon in a thickness not substantially

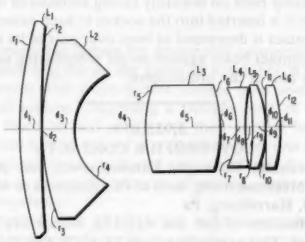


exceeding the thickness of the deposited layer, said coating forming a substantially integral structure with the substrate to seal the deposited layer within said structure and to form a substantially homogeneous light path through the element between the zones of the deposited layer.

3,955,883
WIDE ANGLE PHOTOGRAPHIC LENS

Takahiro Sugiyama, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 6, 1975, Ser. No. 547,683
Claims priority, application Japan, Mar. 7, 1974, 49-26594
Int. Cl.² G02B 9/62
U.S. Cl. 350—215 **2 Claims**



1. A wide angle lens consisting of six lenses wherein the following conditions are satisfied:

(1) $\nu_1, \nu_5 > 50$

(2) $F/1.3 < |F_{1,2}| < F/0.75, F_{1,2} < 0$

(3) $0.1 < |r_5/r_6| < 1.5$

wherein the characters designate dimensions as follows:

F: composite focal length

$F_{1,2}$: composite focal length of the lens system consisting of the first and second lenses

ν_i: Abbe's number of the i-th lens

r_j: the radius of curvature of the j-th surface,

wherein the first lens is a positive meniscus lens convex to the object, the second lens is a positive meniscus lens convex to the object, the third lens is a thick double convex lens, the fourth lens is a double concave lens, the fifth lens is a positive meniscus lens convex to the image, and the sixth lens is a positive meniscus lens convex to the image; and wherein the radii r_1 to r_{12}, the thicknesses and separations d_1 to d_{11}, the refractive indices N_1 to N_6, and Abbe numbers ν_1 to ν_6 of said first to sixth lenses L_1 to L_6, respectively, satisfy the following conditions:

$F = 100$

back focal length $= 130.662$

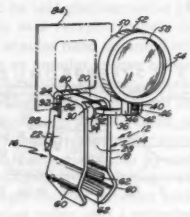
$F_{1,2} = -106.952$

Lens	Radius of Curvature r	Lens Thickness or Distance d	Refractive Index N	Abbe No. ν
L_1	$r_1 = 268.630$	$d_1 = 12.54$	$N_1 = 1.62280$	$\nu_1 = 57.0$
	$r_2 = 1489.437$	$d_2 = 0.35$		
L_2	$r_3 = 179.577$	$d_3 = 19.23$	$N_2 = 1.62041$	$\nu_2 = 60.3$
	$r_4 = 38.908$	$d_4 = 45.42$		
L_3	$r_5 = 94.880$	$d_5 = 44.26$	$N_3 = 1.72000$	$\nu_3 = 43.7$
	$r_6 = -85.317$	$d_6 = 10.56$		
L_4	$r_7 = -62.000$	$d_7 = 4.23$	$N_4 = 1.74077$	$\nu_4 = 27.8$
	$r_8 = 137.345$	$d_8 = 4.86$		
L_5	$r_9 = -237.782$	$d_9 = 8.06$	$N_5 = 1.62041$	$\nu_5 = 57.0$
	$r_{10} = -64.877$	$d_{10} = 0.35$		
L_6	$r_{11} = -1802.817$	$d_{11} = 8.52$	$N_6 = 1.62041$	$\nu_6 = 60.3$
	$r_{12} = -81.169$			

3,955,884
MAGNIFYING LENS HOLDER ASSEMBLY

Andrew Del Pesco, Sr., East Killingly, Conn., assignor to Del Pesco Systems, Inc., East Killingly, Conn.

Filed Nov. 11, 1974, Ser. No. 522,885
Int. Cl.² G02B 7/02
U.S. Cl. 350—248 **9 Claims**



1. A magnifying lens holder assembly comprising a frame in which said lens is mounted, an elongated arm pivotally connected at one end to said frame, a case for receiving said frame and arm assembly, said case comprising a pair of spaced side walls interconnected by a top wall but otherwise substantially open at its side and bottom edges, means defining a socket located at one end of said top wall, a ball member at the other end of said arm swivelly received by said socket, whereby when said assembly is not in use, said frame may be pivoted so as to fold against said arm, and then said arm and frame may be swung about said ball and socket to a position wherein said arm and frame are enclosed within said walls, said side walls having oppositely disposed gently curved portions at their lower extremity for resiliently and clampingly receiving the user's finger.

3,955,885
EYEGLASS SUPPORT DEVICE

Richard B. Aronsohn, 638 Woodruff Ave., Los Angeles, Calif. 90024

Filed Mar. 31, 1975, Ser. No. 563,483
Int. Cl.² G02C 3/00
U.S. Cl. 351—155 **24 Claims**

1. A visual aid which substantially avoids physical contact pressure on the nose of the wearer comprising:

eyeglasses of the type having a pair of lenses in juxtaposition, each lens defining a lower peripheral region, a bridge interconnecting the lenses and a pair of arms each extending normal to and coupled to outermost portions of each lens, each arm extending rearward for being disposed and bearing on the juncture region connecting the ear and temple of a wearer, and being partially frictionally engaged thereby; and

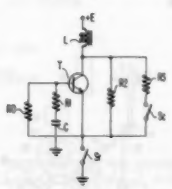
a pair of eyeglass support means joined to the lower peripheral region of each of the lenses for bearing on each cheek of the wearer, each eyeglass support means comprising an eyeglass engaging clamp, a cheek pad and

means coupling the eyeglass engaging grip to the cheek pad, such that the substantial gravitational force of the eyeglass when frictionally pivoted about the temple juncture region is vectorially transmitted through the eyeglass engaging clamp to the cheek pads, the cheek pads frictionally engaging the cheeks and providing sufficient reaction force to maintain the eyeglass elevated above and forward of the nose of the wearer at approximately level vertical alignment with the field of vision of the wearer, thereby introducing minimal vertical imbalance in refractive error.

3,955,886
MOTION PICTURE CAMERA

Takeshi Suzuki, Okazaki, Japan, assignor to Minolta Camera Kabushiki Kaisha, Japan

Continuation of Ser. No. 452,270, March 18, 1974, which is a continuation of Ser. No. 294,867, Oct. 4, 1972, abandoned.
This application Mar. 11, 1975, Ser. No. 557,389
Claims priority, application Japan, Oct. 4, 1971, 46-91008; Dec. 22, 1971, 46-121306
Int. Cl.³ G03B 19/18
U.S. Cl. 352—137 **14 Claims**



1. In a motion picture camera including an optical system, means for providing a D.C. source voltage, a film driving mechanism, a rotatable shutter for exposure of the film, an electromagnet for controlling the rotation of the shutter by its energization, a control means for energizing said electromagnet by a current which temporarily flows through said control means when said control means receives a pulse for effecting one-frame shooting, and a by-pass branch for by-passing said control means for continuously energizing said electromagnet by a by-pass current flowing through said by-pass branch in a continuous shooting,

an electronic circuit for providing said control means with said pulse, comprising:

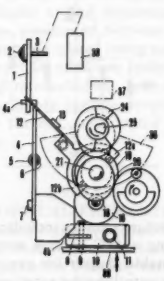
a. first and second terminals between which the D.C. source voltage for said electronic circuit is impressed;
b. a third terminal;
c. a release switch connected between said second and third terminals;
d. a relaxation oscillator connected between said first and third terminals and having a capacitor connected at one end thereof to said second terminal and a discharging means for discharging said capacitor when the voltage across the capacitor exceeds a preset level with said release switch closed, to apply said pulse to said control means;
e. first charging means for charging said capacitor and having a gating means having first, second and third connection points, said first terminal being connected to the first connection point of said gating means and the second connection point of said gating means being connected to the other end of said capacitor;
f. gate control means comprising a first signal path between said first and third terminals and a second signal path between said third terminal and the third connection point of said gating means, said gate control means controlling said gating means so as to permit charging through said first charging means, to said capacitor under the condition that said release switch is opened and to block said charging under the condition that said release switch is closed; and
g. second charging means for charging said capacitor comprising a control switch and a variable resistor connected in series with each other between said first terminal and said other end of said capacitor, whereby said second charging means continuously charges said capacitor under the condition that said control switch is closed and thereby said relaxation oscillator periodically applies said pulse to said control means at intervals determined by the RC time constant of said variable resistor and said capacitor.

3,955,887

MOTION PICTURE CAMERA

Masamichi Toyama; Tomoshi Takigawa, both of Machida; Noritsugu Hirata; Keiichi Sakaguchi, both of Yokohama, and Toshikazu Ichiyanagi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 22, 1974, Ser. No. 472,475
Claims priority, application Japan, May 28, 1973, 48-59619
Int. Cl.² G03B 1/00
U.S. Cl. 352—166 **36 Claims**



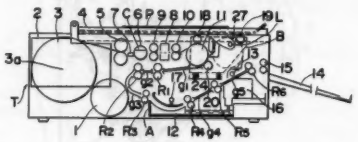
1. A motion picture camera whose effective shutter opening angle is variable comprising;
image forming optics,
a driving means for producing driving power for said camera,
a first rotating means,
a rotatable shutter shaft comprising;
a shutter blade movable into the path of light from the optics for intermittently covering a film to be exposed by rotation of said shutter shaft intermittently,
a second rotating means provided in functional engagement with said first rotating means, one of said first and second rotating means being elliptical,
a third rotating means, said third rotating means being circular, said first and third rotating means being mounted on said shaft for rotation therewith,
a fourth rotating means coupled to said driving means to be driven thereby and capable of assuming a first position in which said fourth rotating means is in functional engagement with said third rotating means but out of the functional engagement with said second rotating means, said fourth rotating means being circular and while coupled to said driving means being capable of assuming a second position out of functional engagement with said third rotating means but in functional engagement with said second rotating means,
switching means for manually switching said fourth rotating means between the first and second positions.

3,955,888

ELECTROPHOTOGRAPHIC COPYING APPARATUS

Tokuzi Kakiuchi, Osaka, and Atsuyuki Tanaka, Sakae, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Azuchi, Japan

Filed July 22, 1974, Ser. No. 490,709
Claims priority, application Japan, Aug. 6, 1973, 48-92566
Int. Cl.² G03G 15/22
U.S. Cl. 355—1 **10 Claims**



1. In a slit exposure type electrophotographic copying apparatus which comprises a horizontally, reciprocatingly movable transparent platform on which can be placed an original to be copied, a stationary optical system provided below said platform, said optical system including a light source for illuminating said original and means for directing image rays from said original to an exposure position thereof, an exposure roller rotatably provided adjacent to said image ray directing means adjacent said exposure position, means for charging and feeding a photosensitive copy paper sheet to said exposure roller, means for developing said copy paper sheet after exposure, and means for discharging said copy paper sheet from said apparatus after drying, the improvement comprising an optical frame within which said light source and said image ray directing means are secured in predetermined relative positions, a first pair of rollers and a further pair of rollers spaced from said first pair, each of said pairs of rollers being rotatably mounted at an upper portion of said optical frame, said exposure roller being rotatably mounted below said first rollers, and a third pair of rollers for transportation of said copy paper sheet rotatably mounted below said exposure roller, means urging said first rollers and said third rollers into contact with said exposure roller for synchronous rotation therewith, and spring means between the bottom of said optical frame and said copying apparatus and biasing said optical frame against the under surface of said platform with said first and second rollers, contacting said under surface so that said exposure roller rotates in association with movement of said platform.

3,955,889

APPARATUS FOR STRIPPING RECEPTOR PAPERS FOR USE IN ELECTROPHOTOGRAPHIC MACHINES

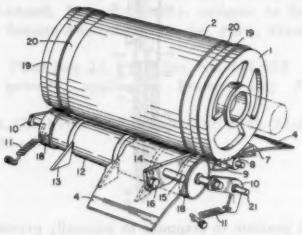
Tsutomu Ishiguro, Kawaguchi; Hirofumi Shinnishi, Kawasaki; Yukio Katano, Kawaguchi, and Kohji Ueda, Tokyo, all of Japan, assignors to Katsuragawa Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 11, 1974, Ser. No. 531,669

Claims priority, application Japan, Dec. 20, 1973, 48-143226; Dec. 20, 1973, 48-143227

Int. Cl.² G03G *15/22*

U.S. Cl. 355—3 R **4 Claims**



1. In apparatus for stripping receptor paper away from the photosensitive drum of an electrophotographic machine, said drum carrying a photosensitive element thereon, after the latent image formed on said photosensitive element has been transfer printed onto said receptor paper, the improvement which comprises an annular band mounted on one end of said drum so as to define an annular groove between said annular band and said photosensitive element, an electroconductive stripping roller a frictional band mounted on said stripping roller at a position facing said annular band, means for urging the frictional band of said stripping roller against said annular band for driving of said stripping roller by said photosensitive drum, means for passing said receptor paper about said photosensitive drum through the nip between said photosensitive drum and said stripping roller, and a stripping pawl having a pointed end which is adapted to engage the leading edge of said receptor paper near a point at which said photosensitive drum and said stripping roller contact each other and to protrude into said annular groove for stripping said receptor paper away from the periphery of said photosensitive drum and for urging the stripped edge of said receptor paper against said frictional band on said stripping roller.

3,955,890

METHOD OF MEASURING THE DEFORMATION CAPACITY OF MICROSCOPIC OBJECTS, MORE PARTICULARLY RED BLOOD CORPUSCLES AND A DEVICE FOR IMPLEMENTING THE METHOD

Marcel Bessis, and Narla Mohandas, both of Paris, France, assignors to Institut National de la Sante et de la Recherche Medicale Organisme D'Etat, Paris, France

Filed Apr. 29, 1975, Ser. No. 572,876

Claims priority, application France, May 10, 1974, 74.16160

Int. Cl.² G01N *11/00*

U.S. Cl. 356—39 **10 Claims**

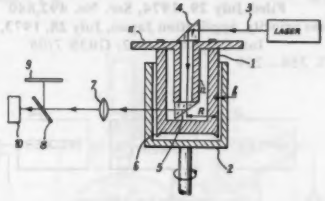
1. A method of measuring the deformation and deformation capacity of microscopic objects in suspension in a liquid comprising the steps of :

placing said suspension between inner and outer transparent coaxial walls having a common axis of rotation ;

directing a beam of light through said liquid substantially normal to the common axis of said coaxial walls causing diffraction rings to form on a screen ;

measuring the characteristic dimensions of the diffraction rings while said walls are at rest ;

rotating said inner and outer coaxial walls at different speeds of rotation relative to their common axis of rotation ;



measuring the characteristic dimensions of the diffraction rings while said walls are rotating relative to each other ; and

determining the deformation and the deformation capacity of said microscopic objects as a function of the relative speed of rotation of the two walls.

3,955,891

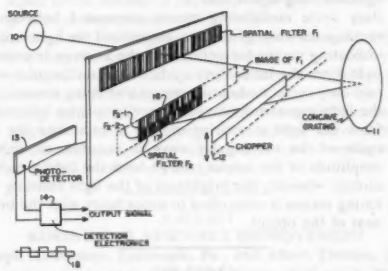
CORRELATION SPECTROMETER

Sheldon A. Knight, Sunnyvale, and Max Daehler, Belmont, both of Calif., assignors to Quantic Industries, Inc., San Carlos, Calif.

Continuation-in-part of Ser. No. 432,398, Jan. 10, 1974, abandoned. This application Mar. 4, 1975, Ser. No. 555,239

Int. Cl.² G01J *3/42*

U.S. Cl. 356—74 **5 Claims**



1. A correlation spectrometer for accepting light from a source such light having a plurality of different wavelength intervals comprising: means for dispersing said light, a first spatial filter between said light source and dispersing means, a second spatial filter having photographically opposite first and second portions for receiving light which has been dispersed by said dispersing means, chopper means for chopping said dispersed light to alternatively block said dispersed light from each of said filter portions, photodetector means for sensing the light transmitted through said second filter, said first and second filters having related patterns derived from Hadamard matrices said filter patterns being a composite of a plurality of filter patterns for a plurality of selected wavelength intervals representing components of said light source, which are combined by predetermined weighting to form unitary filters which provide at said photodetector means a weighted linear combination of the intensities of said selected wavelength intervals of said light from said light source.

3,955,892

DEVICE FOR INDICATING EXPOSURE INFORMATION IN THE VIEWFINDER OF A CAMERA

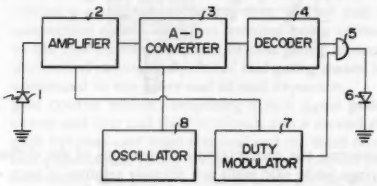
Saburo Numata, Urawa; Iwao Sagara, Higashikurume, and Hirohisa Shishikura, Kodaira, all of Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya and Oki Electric Industry Company, Ltd., Tokyo, both of, Japan

Filed July 29, 1974, Ser. No. 492,840

Claims priority, application Japan, July 28, 1973, 48-85168

Int. Cl.[2] G01J 1/42; G03B 7/08

U.S. Cl. 356—219 7 Claims



1. In a camera comprising a viewfinder in which an image of an object to be photographed is presented, means comprising:

a light measuring circuit including a photodetector which receives light from the object to be photographed and generates an output voltage having an amplitude corresponding to the brightness of the object;

a light emitting indicating means connected to said light measuring circuit for indicating exposure information in accordance with the output voltage therefrom, said indicating means being visible in said viewfinder along with said image;

a rectangular wave generating means connected to said light emitting indicating means for supplying to the latter a light emitting signal; and

a duty cycle modulating means connected between the rectangular wave generating means and the light emitting indicating means for controlling the average intensity of light from the latter duty cycle of the rectangular wave, said duty cycle modulating means also being connected to the light measuring circuit to receive output information from the light measuring circuit to modulate the duty cycle of the rectangular wave in accordance with the amplitude of the output voltage from the light measuring circuit, whereby the brightness of the light emitting indicating means is controlled in accordance with the brightness of the object.

3,955,893

WRITING INSTRUMENT WITH PROJECTING AND RETRACTING MECHANISM

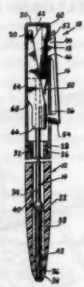
Albert Pulaski, Hollis, N.Y., assignor to K. C. Pen Co., Inc., Brooklyn, N.Y.

Continuation of Ser. No. 259,390, June 5, 1972, Pat. No. 3,819,283. This application June 20, 1974, Ser. No. 478,721

Int. Cl. B43k 24/02

U.S. Cl. 401—106 10 Claims

1. A writing instrument comprising a casing having a first opening at one end, a writing cartridge mounted within said casing for reciprocal longitudinal movement therein between projected writing position through said casing opening and retracted position, spring means normally biasing said cartridge into retracted position, a pair of cam elements within the casing, one a cam faced element and the other a cam follower, said cam faced element having adjacent high and low cam faces which are disposed in angular relation to each other, a lever pivotally positioned within said casing remote from said casing one end, said lever having first and second ends and a fulcrum intermediate thereof, said cam follower being positioned on the first end of the lever and being alternately engageable with said cam faces in response to pivoting of the lever, a pocket clip, said casing having second and third openings therein, said second opening registerable with said second end of said lever, means rockably mounting the clip to the casing about the third casing opening, said clip including an inwardly directed projection adjacent one end registering with said second opening in said casing and engageable with the second end of the lever, the cartridge being displaced into



projected position in response to manually pressing the clip end having the projection inwardly relative to the casing for actuating the lever in one direction about its fulcrum causing the cam follower to engage the high cam surface of the cam-faced element, the cartridge being displaced into retracted position in response to manually depressing the other clip end inwardly relatively to the casing for actuating the lever in the opposite direction about its fulcrum causing the cam follower to engage the low cam face of the cam faced element.

3,955,894

TUBULAR WRITING PEN

Walter Jozat, Bad Bramstedt, Germany, assignor to Koh-I-Noor Rapidograph, Inc., Bloomsbury, N.J.

Filed Feb. 26, 1975, Ser. No. 553,412

Claims priority, application Germany, Mar. 14, 1974, 2412210

Int. Cl. B43k 1/10

U.S. Cl. 401—259 9 Claims

1. A tubular pen of the type comprising in combination a cylindrical body provided with an axial inner bore, having at its front end a writing tube and an outer surface defining an ink equalizing chamber which is in communication, through at least one transverse bore, with said inner bore which is in turn in communication with an ink supply chamber, said inner bore having therein a fall weight with a cleaning wire protruding into said writing tubule, and further including a casing element with a portion receivably mounted upon said cylindrical body and adapted for sealing said ink equalizing chamber, wherein the improvement comprises: a tubular extension upon said

cylindrical body, said extension extending rearwardly and connecting said cylindrical body and said ink supply chamber, said extension in communication with said inner bore and said ink supply chamber, said tubular extension together with said casing element defining means to allow said tubular extension to be moved forward to a limited extent within said casing element to thereby expose said ink equalizing chamber on said outer surface of said cylindrical body, characterized in that the axial length of said tubular extension corresponds approximately to the axial length of said ink equalizing chamber.

3,955,895

RAIL EXPANSION JOINT

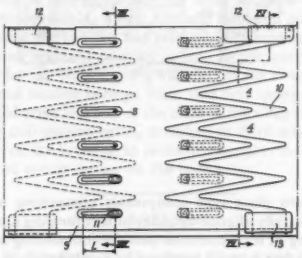
Roger Raimbault, Ermont, France, assignor to Societe dite Aeropar Societe Anonyme Francaise, Paris, France, a part interest

Filed July 25, 1974, Ser. No. 491,933

Claims priority, application France, July 27, 1973, 73.27541

Int. Cl.² F16B *7/00*; **F16D** *1/00*; **F16L** *23/00*

U.S. Cl. 403—340 **4 Claims**



1. In a rail expansion joint comprising a first part adjacent to and in sliding relationship to a second part, said first and second parts being identical to each other and being disposed in facing relationship such that the attitude of one is **180°** with respect to the attitude of the other, each said part comprising a first portion having a full cross-sectional thickness corresponding to the thickness of said rail, and a second portion having a cross-sectional thickness substantially half that of said first portion so that the two half portions of said first and second parts are in side-by-side sliding relationship to provide a full width section, the improvement consisting in that:

each said portion of said first and second parts terminates in a sawtooth profile adapted to engage the complementary teeth of the two sawtooth portions of the other part,

said second portion of each part extending completely beyond the complementary engaged sawtooth profiles of the first portion of the same part and the second portion of the other part, and extending to engage the first portion of the other part, and wherein

the two second portions of said two parts are slidably assembled by means of screws or bolts inserted through circular holes made in one of said parts and passing through oblong parts made in the other said part, said circular holes and said slots being located, respectively, in said second portion at the base of each tooth of said second portion and opposite each gap between the teeth of said first portion.

3,955,896

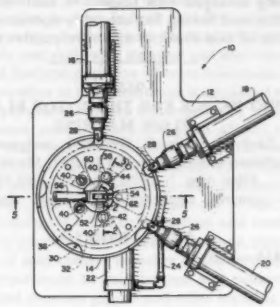
SPIDER MACHINING APPARATUS

Dalton M. Davis, Palos Verdes Estates, Calif., assignor to E-T Industries, Inc., Benicia, Calif.

Division of Ser. No. 123,218, March 11, 1971, Pat. No. 3,891,343. This application Mar. 10, 1975, Ser. No. 556,626

Int. Cl.² B23B *35/00*

U.S. Cl. 408—1 R **6 Claims**



1. A method for forming complete groups of depressions on the outer periphery of a vehicle wheel assembly having spokes extending from a center section to said outer periphery,

said method including the steps of:

rotating said wheel assembly in increments, each increment being equal to 360° divided by the number of said spokes;

simultaneously drilling a plurality of separate, spaced apart depressions within the outer periphery of said wheel assembly at each increment of said incremental rotation, each of said depressions being simultaneously drilled opposite adjacent ones of said spokes, the number of depressions made at each increment of rotation being equal to the number of depressions desired in each of said groups of depressions;

simultaneously drilling each of said depressions at a spacing less than the incremental distance of each of said increments by an angle equal to the space between said depressions in each of said groups; and

rotating said wheel assembly 360° minus the number of degrees of each increment of rotational movement, to obtain said complete groups of depressions on the outer periphery at each of said spokes.

3,955,897

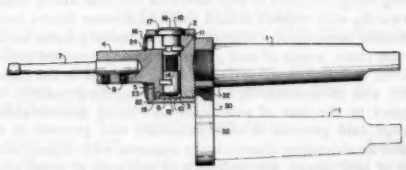
BORING BAR ASSEMBLY IMPROVEMENT

Joseph M. Roman, Zelienople, Pa., and Albert Thomas, Fairfax, Va., assignors to Joseph M. Roman, Zelienople, Pa.

Filed Oct. 29, 1974, Ser. No. 518,802

Int. Cl.² B23B *51/00*

U.S. Cl. 408—186 **3 Claims**



1. In combination with a boring bar assembly including shank and bit holder members, and a housing for holding said bit holder and permitting relative transverse movement of said bit holder, the improvement therewith being a lateral adjustment assembly comprising an elongated lateral bar member

fixed at one end portion thereof to said housing at the end of said housing away from said bit holder with the longitudinal axis of said lateral bar extending transversely of the axis of said bit holder; said lateral bar having a plurality of longitudinally spaced threaded receptacles defined in the face thereof disposed away from said housing the axes of said threaded receptacles being generally parallel; said shank member having a threaded end section sized to be selectively secured to said lateral bar within any one of said receptacles; and said receptacles being arranged with respect to each other in such a manner that said boring bar assembly operates stably in any relationship of said shank in any of respective receptacles.

3,955,898

LOCKING DEVICE FOR THE ROTOR BLADES OF A FLOW MACHINE

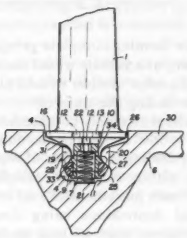
Gerhard Zaehring, Munich, Germany, assignor to Motoren- und Turbinen-Union Munchen GmbH, Munich, Germany

Filed Aug. 7, 1975, Ser. No. 602,792

Claims priority, application Germany, Aug. 13, 1974, 2438757

Int. Cl.² F01D 5/32

U.S. Cl. 416—215 **6 Claims**



1. In a flow machine of the type having a rotor with a circumferential slot in its rim, the circumferential slot having laterally projecting flanks, a plurality of rotor blades radially locked in said circumferential slot by said projecting flanks, a blade stacking hole in said circumferential slot to enable insertion of the roots of said rotor blades in said circumferential slot, whereby the roots of said rotor blades may be circumferentially slid in said circumferential slot, a locking device in said circumferential slot between the roots of a pair of blades, said locking device being insertable in said blade stacking hole and having a coil spring, wherein said locking device may be locked circumferentially within the blade stacking hole between said laterally projecting flanks with the assistance of the restoring force of said coil spring; the improvement wherein said locking device comprises a lock foot having sides engaging the sides of the roots of a pair of said rotor blades, a sleeve mounted for rotation in said lock foot and having an axis that extends radially with respect to said rotor, said sleeve projecting centrally, radially, outwardly from said lock foot, said coil spring being mounted to urge said lock foot and sleeve radially outwardly with respect to said rotor, said rotor blades having pedestals substantially aligned with the radially outer surface of said rotor, a pair of said pedestals having opposed grooves in their radially inward surfaces, a pair of tangs on the radially outer end of said sleeve, said tangs projecting radially with respect to the axis of said rotor and being positionable to engage said grooves in said pedestals, said grooves in said pedestals extending diametrically opposite with respect to the axis of said sleeve, the pedestals of said pair of rotor blades abutting each other circumferentially, a gap formed between the abutting edges of said pedestals, said gap being positioned at substantially right angles to said grooves, in the radial undersides of said pedestals, said tangs being positioned to engage said gap in said abutting edges upon rotation of said sleeve, whereby said locking device may be positioned in said blade stacking hole between said laterally projecting flanks when said tangs engage said gap in said abutting edges.

3,955,899

APPARATUS FOR LUBRICATING A SWASH PLATE COMPRESSOR

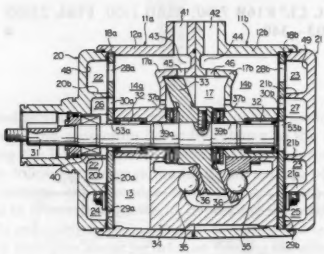
Shozo Nakayama; Masayuki Kurahashi, and Kimio Kato, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Japan

Filed Apr. 29, 1974, Ser. No. 465,268

Claims priority, application Japan, May 11, 1973, 48-55910

Int. Cl.² F04B 1/00

U.S. Cl. 417—269 **6 Claims**

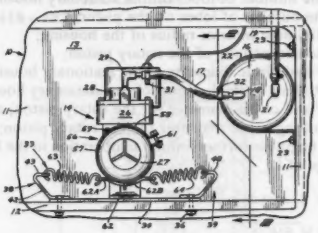


1. A swash plate type compressor comprising: a pair of horizontal axially aligned cylinder blocks forming a combined block having at least one inlet port for introducing a refrigerant gas together with oil particles suspended therein from the exterior of the compressor into the combined block, a plurality of oil separating passageways extending in opposite axial directions of the combined block for separating the oil particles from the introduced refrigerant gas; a swash plate chamber defined in the middle portion of said combined block, a plurality of compressor pistons and a plurality of cylinder bores in said combined block in which said compressor pistons are mounted, a drive shaft extending through said swash plate chamber, a swash plate in said swash plate chamber rotatably supported on said drive shaft, said swash plate causing reciprocal motions of said compressor pistons slidably retained in said cylinder bores of said combined block; a pair of cylinder heads positioned at the ends of said combined block, each said head having a suction chamber connected to each said oil separating passageway, and valve plates interposed between said cylinder heads and said cylinder blocks, the improvement wherein said valve plates are provided with oil inlet holes, respectively, for introducing the separated oil in said oil separating passageways into oil retainers, respectively, said oil retainers being constituted by wall members projecting from internal end faces of said cylinder heads and, wherein each of said wall members constituting said oil retainer defines, in each said suction chamber of each said cylinder head, an outer suction chamber provided with a suction port for enabling distribution of said refrigerant gas introduced from said oil separating passageway to cylinder bores in said combined block, and an inner suction chamber connected to said outer suction chamber via an opening formed in said wall member, said opening being remote from at least one of said cylinder bores which is located downwardly adjacent to said suction port of said outer chamber.

3,955,900
MOUNTING STRUCTURE

J. Fredrick Vinci, 141 Woodland Drive, Forest City, Iowa 50436

Filed Mar. 17, 1975, Ser. No. 558,905
Int. Cl. F04b *17/00*
U.S. Cl. 417—361 19 Claims

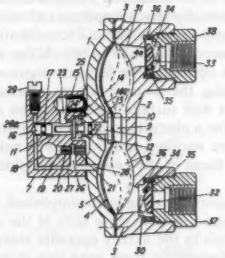


1. An air compressor and mount assembly comprising compressor means having a moving piston to compress air, motor means for moving the piston and a housing for the compressor means and motor means, a mount assembly for supporting the compressor means and motor means, said mount assembly having a base plate adapted to be secured to a fixed support, a plurality of upwardly directed arms secured to the base plate, a holder having a first part and a second part said parts surrounding the housing and releasably clamped on the housing, a strap member secured to one of the parts, said strap member having ends aligned with two of the arms, and a pair of first coil tension springs, each said first spring attached to one of said arms and one of the ends of the strap member, and a second coil tension spring attached to third arm and means mounted on the housing, to resiliently support the compressor means and motor means on the base plate.

3,955,901
MEMBRANE PUMP

Thomas W. Hamilton, 27 Clevehurst Close, Stoke Poges, Buckinghamshire, England

Filed Sept. 23, 1974, Ser. No. 508,697
Claims priority, application United Kingdom, Oct. 23, 1973, 49353/73
Int. Cl.[2] F04B *43/06*, *45/00*; F16K *15/00*
U.S. Cl. 417—395 4 Claims



1. A gas pressure-operated membrane pump for pumping liquids, said pump comprising a housing defining a chamber, a limp flexible membrane in said chamber, a gas pressure compartment on one side of said membrane within said chamber, a liquid pumping compartment on the other side of said membrane within said chamber, means defining a gas inlet and outlet to said gas pressure compartment, means defining a liquid inlet and outlet to said pumping compartment, control valve means for controlling the gas supply and outlet from said gas pressure compartment, said control valve including a valve member and means operatively connected to said valve member for moving said valve member between first and second end positions, said means for moving said valve member including a control member and means attaching said control member to said membrane for movement of said control member by said membrane between first and second end positions corresponding to said first and second end positions of said valve member, means for restraining said control member and said valve member in both said first and second end positions, whereby, when said pump is connected to a pressurized gas supply and said valve member and said control member are in said first end positions wherein said means attaching said control member to said membrane is displaced within said gas pressure compartment, gas under pressure is admitted to said gas pressure compartment and parts of said membrane spaced from said means attaching said membrane to said control member are displaced to reduce the volume of said pumping compartment to discharge liquid therefrom in a discharge stroke, and shortly before the end of said discharge stroke, said membrane initiates movement said control member, against the action of said restraining means, from said first end position of said control member in the direction of said pumping compartment to said second end position thereof and said control member moves said valve member from said first end position to said second end position thereof wherein said valve member causes said gas to be exhausted from said gas pressure compartment, so that parts of said membrane spaced from said means attaching said membrane to said control member are displaced back to increase said volume of said pumping compartment and admit further liquid to said pumping compartment in an intake stroke, and shortly before the end of said intake stroke, said membrane initiates movement said control member against the action of said restraining means in the direction of said gas pressure compartment back into said first end position of said control member and said control member moves said valve member from said second end position back into said first end position thereof wherein said valve member allows further gas under pressure to be admitted to said gas pressure compartment, said pump further comprising means defining a gas inlet duct for connection to said source of gas under pressure, a venturi including a throat, means communicating said gas inlet duct with said venturi, means communicating said gas inlet and outlet to said throat and means defining a gas outlet from said venturi, said valve member being operatively arranged to close said outlet from said venturi when said valve member is in said first end position thereof and to open said outlet to atmosphere when said valve member is in said second end position thereof whereby when said valve member is in said first end position thereof gas supplied under pressure to said inlet duct pressurizes said gas pressure compartment and when said valve member is in said second end position thereof, gas from said inlet duct flows through said venturi and exhausts gas from said gas pressure compartment through said throat.

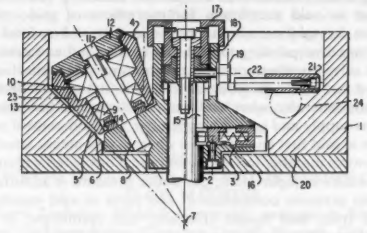
3,955,902
FLEXIBLE TUBE PUMP

Erik Bach Kyvsgaard, 6, Melchiorsvej, 2920 Charlottenlund, Denmark

Filed May 28, 1974, Ser. No. 474,062
Claims priority, application Denmark, May 29, 1973, 2953/73; May 22, 1974, 2787/74
Int. Cl.[2] F04B *43/12*
U.S. Cl. 417—477 8 Claims

1. Pump with a housing comprising an internal surface forming at least a half circle and a rotor with two oppositely arranged rollers comprising a flexible tube against the surface and in which the compressed part of the tube during the rotation of the rotor is moving along the tube, wherein the half-circular surface is part of a cone, the rollers being truncated cones having their vertices in the area of the vertex of

the internal surface, wherein the tapering angle of the cone of the internal surface is 30° – 120°; wherein at least one of the



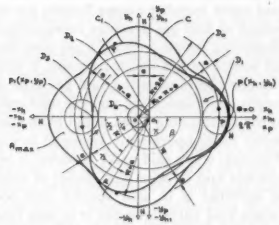
rollers is axially adjustable with respect to the rotor and the rotor comprises control adjusting means for axial movement of the rotor with respect to the housing.

3,955,903

ROTARY PISTON ENGINE WITH IMPROVED HOUSING AND PISTON CONFIGURATION

Tibor Louis de Dobo, Highland Park, N.J., assignor to Aranka Elisabeth de Dobo, Basel, Switzerland

Filed May 10, 1974, Ser. No. 468,858
Int. Cl.² F04C 1/02
U.S. Cl. 418—61 B **6 Claims**



1. An improved multilobe rotary piston engine comprising:

a housing including H lobes and having an interior cavity profile described by the curve generated by the locus of a point P_h within the diameter D_1 of a rolling circle as it revolves around a second fixed circle of diameter D_0; and

a piston having P lobes and a profile which permits operative engagement of the piston with the profile of the housing profile, said piston having a profile described by a curve generated by the locus of a point P_p within the diameter D_3 of a rolling circle as it revolves around another fixed circle of a diameter D_2;

wherein the relationship between the profile of the housing and the profile of the piston is described as follows:

a. $H = P + 1$

b. $H = D_0/D_1$

c. $P = D_2/D_3$

d. $R = \dfrac{D_3 + D_h}{2}$ and

e. $R + e = \dfrac{D_2 + D_1}{2}$

Where:

H = The number of lobes on the stationary housing;
P = The number of lobes on the piston;
R = Minimum interior radius of the housing;
e = The eccentricity of the rotary piston;
D_0 = Fixed circle diameter of the stationary housing;
D_1 = Rolling circle diameter of the stationary housing;
D_2 = Fixed circle diameter for the rotary piston; and
D_3 =Rolling circle diameter for the rotary piston; wherein said engine is further limited to operation in the following range of L:

$1 \leq L \leq 1.5$; and,

$L = \sqrt{E/K}$

Where:

L = Limitation range factor;
E = the engine compression ratio; and,
$K = R/e$.

3,955,904

JUNCTION SEAL FOR ROTARY ENGINES

Robert K. Catterson, Brookfield, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed June 13, 1975, Ser. No. 586,582
Int. Cl.² F01C 19/08, 19/10
U.S. Cl. 418—121 **7 Claims**

1. In a machine of the character described wherein a rotor having circumferentially spaced apexes and axially opposite side faces planetarily revolves about a rotor shaft in a housing having axially spaced side walls in which the rotor shaft is journalled with its opposite side faces contiguous to said side walls of the housing, the housing having a basically trochoidally shaped inner wall surface with which the apexes of the rotor coact to define a plurality of discrete chambers that must be sealed from one another and from the running clearance between the side faces of the rotor and the side walls of the housing,

wherein the required sealing is accomplished conjointly by apex seals seated in transverse slots in the apexes of the rotor, side seals in the axially opposite sides of the rotor extending substantially from apex seal to apex seal, and junction seals located at the junctions of the apex seals and the side seals,

the improvement which resides in:

the junction seals at one side of the rotor being integral portions of the rotor, while those at the other side of the rotor are parts that are fabricated independently of the rotor and assembled therewith in the conventional manner and hence separable from the rotor.

3,955,905

SLIDING-VANE PUMP

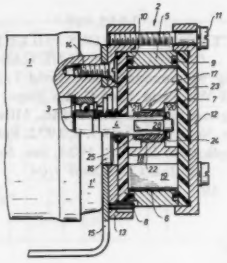
Wilfried Frommholz; Wolfgang Scheidel, both of Buhl, and Heinz Rübig, Buhlertal, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed July 2, 1974, Ser. No. 485,307

Claims priority, application Germany, July 17, 1973, 2336307

Int. Cl.² F01C 17/06

U.S. Cl. 418—182 8 Claims



1. A sliding-vane pump, comprising a pump housing; an electromotor having an output shaft extending into said pump housing; a rotor mounted on said output shaft for rotation therewith and having a plurality of substantially radial slots; a sliding vane in each of said slots; and mounting means mounting said rotor on said output shaft with limited freedom of tilting movement relative to said output shaft about two axes which are normal to each other and to said output shaft, said mounting means comprising a body of substantially quadratic outline having a pair of end faces extending normal to the axis of said shaft, a pair of concave first side faces diametrically opposite one another and having a common first axis of curvature, and a pair of convex second side faces diametrically opposite one another and having a common second axis of curvature, said axes of curvature constituting said two axes.

3,955,906

SYSTEM FOR TRANSPORTING A FILAMENT- BUNDLE FROM A SPINNING PROCESS TO A SUCCESSIVE DRAWING PROCESS

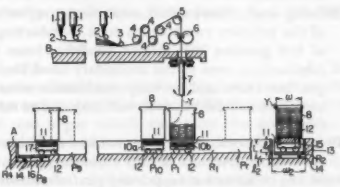
Yasuhiro Murase, Matsuyama; Mitsuji Ito, Kawanishi; Nobuharu Izawa, Ehime, and Masahiro Matsui, Matsuyama, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Aug. 19, 1974, Ser. No. 498,296

Claims priority, application Japan, Aug. 22, 1973, 48-93256; Aug. 22, 1973, 48-93257; Aug. 22, 1973, 48-97539[U]; Aug. 23, 1973, 48-93817

Int. Cl.² D01D 7/00

U.S. Cl. 425—88 3 Claims



1. In a textile factory provided with at least one spinning equipment for producing an undrawn filament-bundle and at least one drawing equipment for drawing said undrawn filament bundle, said spinning equipment provided with a delivering mechanism for depositing said undrawn filament bundles in cans and said drawing equipment provided with a creel extended outward therefrom for removing said filament bundles from said cans, a system of transporting said filament bundle by said cans, a cans carrying passage formed on a base floor wherein each drawing equipment is installed, said cans carrying passage formed on said base floor comprising a first passage for transporting full packaged cans filled with said filament bundle from a first position below said delivering mechanism to a second position, and at least one branched passage connected to said first passage and arranged at a position adjacent to said creel in paralleled condition to said extended creel, and a second passage for transporting empty cans from said branched passage to an upstream terminal of said first passage, a system of transporting said filament bundle by cans, comprising means for carrying said cans along said cans carrying passage at predetermined positions, means for stopping said cans carrying means at any of said predetermined positions, each of said first and second passages being provided with apparatus carrying means, said cans carrying means being provided with a combined transporting equipment comprising a main carrier being capable of moving in either of two directions along said first and second passages toward either one of said upstream and downstream terminals thereof and an auxiliary carrier capable of being positioned on said main carrier in either of the first and second passages and capable of moving along said first and second main passages and said branched passage, each said auxiliary carrier being provided with a lifting member for supporting a can above said base floor and for positioning said can on said base floor according to upward or downward displacement thereof, and means for aligning a plurality of said auxiliary carriers along said branched passage for retaining said auxiliary carriers in said aligned position, cans thereon are emptied by said creel, and for moving said aligned auxiliary carriers back to said first main passage with said empty cans.

3,955,907

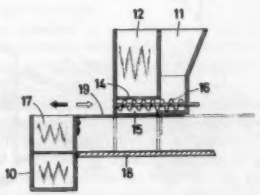
APPARATUS FOR MOLDING LAYERED CONCRETE SLABS

Keniti Yamasita, 3-34, Nishimachi 2-chome, Gamou, Koshigaya, Saitamo, and Zyozi Yamasita, 21-17, Sugano-cho 2-chome, Ichikawa, Chiba, both of Japan

Division of Ser. No. 311,786, Dec. 4, 1972, abandoned, which is a continuation of Ser. No. 94,750, Dec. 3, 1970, abandoned. This application May 28, 1974, Ser. No. 473,917

Int. Cl.² B28B 1/16, 13/02

U.S. Cl. 425—130 1 Claim



1. An apparatus for the manufacture of molded concrete slabs comprising in combination:

1. a first hopper for holding a relatively small-diameter concrete making material adapted to produce a decorative surface, the first hopper having
   a. a first portion for receiving the material and
   b. a tunnel-shaped second portion extending from the first hopper portion, the second hopper portion defining a first opening extending therealong,
2. a second hopper for holding a concrete making material of larger diameter than the material in the first hopper, the second hopper having

a. a first portion adjacent the first portion of the first hopper and
b. a second portion on each side of the tunnel-shaped portion of the first hopper, the second hopper portion defining two second openings extending alongside the first opening on each side thereof and being substantially wider and coplanar therewith,

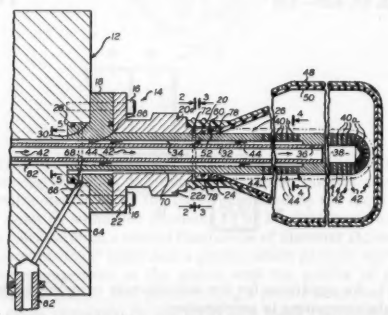
3. a screw conveyor disposed in the tunnel-shaped second portion of the first hopper and arranged to convey the small-diameter concrete making material from the first portion of the first hopper into the second portion thereof whereby the material is delivered to the first opening,
4. a mold having an upper opening mating in area with the total area of the first and second openings in the hoppers,
5. an auxiliary frame having an upper and lower end,
a. the frame ends having openings mating in area with that of the openings in the mold and in the hoppers, and the frame comprising
b. two partitions defining a central portion for alignment with the tunnel-shaped second portion of the first hopper and two outer portions for alignment with the second openings in the second hopper,
6. a platform disposed to support the auxiliary frame movably between a first position wherein the portions of the frame are in alignment with the openings in the hopper and a second position wherein the portions of the frame are in alignment with the opening in the mold, and
7. a shutter member disposed to open the openings in the hoppers in the first position of the frame and to close the openings in the hoppers in the second position of the frame, the materials in the hoppers passing through the openings therein into the aligned portions of the auxiliary frame to fill the same when the shutter member opens the openings in the hoppers, and the materials in the portions of the auxiliary frame passing into the mold to fill the same while the shutter member closes the openings in the hoppers.

3,955,908

BALLOON BLOW MOLDING TOOLING

John J. Farrell, Green Brook, N.J., assignor to Farrell Patent Company, Green Brook, N.J.

Continuation-in-part of Ser. No. 246,878, April 24, 1972, Pat. No. 3,816,046. This application Nov. 28, 1973, Ser. No. 419,510
Int. Cl.² B29D *23/03*
U.S. Cl. 425—390 **14 Claims**



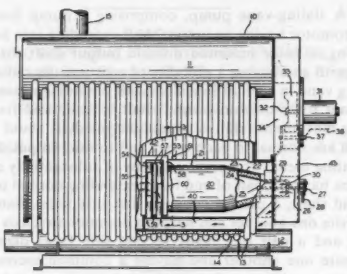
1. An apparatus for blow molding a container having a neck portion and a body portion including a core rod support, a core rod assembly including a core rod, means near one end of the core rod for connecting it with the core rod support, an elastic balloon that fits closely over the core rod when said balloon is deflated, a connection between the balloon and the core rod assembly, passages within the core rod, including a first passage for introducing fluid into the core rod and another passage for withdrawing fluid from the core rod, and openings through the side of the core rod at locations within the surface of the core rod that is covered by the balloon, including a first plurality of said openings that leads to the first passage and another plurality of said openings that leads to the other passage, said first and second plurality of said openings being axially spaced along said core rod, said first plurality of said openings being formed to introduce fluid in a plurality of radial directions and said second plurality of said openings being formed to withdraw fluid from a plurality of radial directions, so that in blowing the balloon the container body width is made greater than the neck width.

3,955,909

REDUCTION OF GASEOUS POLLUTANTS IN COMBUSTION FLUE GAS

Glenn D. Craig, Menomonee Falls; David T. Feuling, Milwaukee, both of Wis., and Paul G. La Haye, Cape Elizabeth, Maine, assignors to Aqua-Chem, Inc., Milwaukee, Wis.

Division of Ser. No. 295,249, Oct. 5, 1972, Pat. No. 3,837,788. This application July 12, 1974, Ser. No. 488,057
Int. Cl.² F23M *3/04*
U.S. Cl. 431—10 **10 Claims**

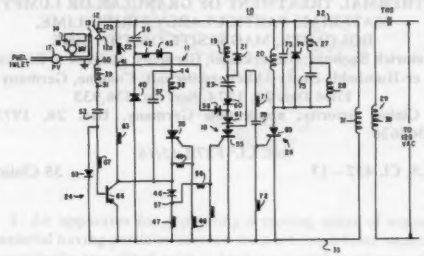


1. Fuel burning method for minmizing the discharge of nitrogen oxide in its exhaust gases comprising:
defining a primary combustion zone having an inlet for primary combustion air and an outlet for gaseous combustion products,
providing fuel to said primary combustion zone, delivering less than the stoichiometric amount of air to said inlet to burn said fuel at a temperature and under conditions whereby the combustion products include significant residual amounts of unoxidized hydrocarbons and carbon monoxide,
defining a secondary combustion zone coupled to the outlet of the primary combustion zone, conducting the stream of hot gaseous combustion products from the primary combustion zone to the secondary zone, the direction of gas flow from said primary combustion zone to said secondary combustion zone defining a downstream direction,
flowing said combustion gases around and between a plurality of flow diverters in said secondary zone, and
injecting combustion supporting gas from downstream areas of each of said flow diverters and into plural regions of said combustion gases as the latter passes around said diverters whereby to oxidize the residual unoxidized hydrocarbon and carbon monoxide at a temperature below which significant amounts of nitrogen oxides are formed.

3,955,910
SELF-CHECKING AUTOMATIC PILOT FUEL IGNITION SYSTEM

Russell Byron Matthews, Goshen, Ind., assignor to Johnson Service Company, Milwaukee, Wis.

Filed Sept. 23, 1974, Ser. No. 508,418
Int. Cl.² F23Q *3/00*
U.S. Cl. 431—25 **20 Claims**



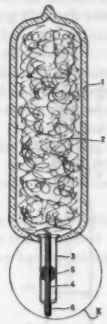
1. In a fuel ignition system including at least one valve means operable when energized to supply fuel to a fuel outlet, an ignition circuit for controlling the operation of said valve means and for igniting fuel emanating from said outlet, said ignition circuit comprising ignition means operable to generate ignition sparks in the proximity of said outlet for igniting fuel emanating therefrom to establish a flame, energizing means controlled by said ignition means to energize said valve means, sensing means for controlling the operation of said ignition means, said sensing means being disabled in the absence of a flame at said outlet to enable said ignition means to operate, and said sensing means being enabled whenever a flame is established at said outlet to normally disable said ignition means to inhibit the generation of ignition sparks, said sensing means including timing means for permitting said sensing means to periodically enable said ignition means to operate to generate ignition sparks for a predetermined time while a flame is established, said energizing means being operable to deenergize said valve means whenever said ignition means fails to operate during said predetermined time.

3,955,911
PERCUSSION FLASHLAMP

Bauke Jacob Roelevink, Terneuzen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 27, 1974, Ser. No. 455,499
Claims priority, application Netherlands, Apr. 16, 1973, 7305265
Int. Cl.² F21K *5/02*
U.S. Cl. 431—93 **1 Claim**

1. A percussion flashlamp which comprises a lamp envelope formed from a transparent material and filled with a combustible material and a gas which maintains the combustion, a metal tube sealed to said lamp envelope, a generally cylindrical anvil extending coaxially in said tube and an ignition mass disposed between the anvil and the inner wall of the tube at one axial portion substantially midway between the axial extremities of said anvil, said tube having an axial elongated cylindrical section remote from said lamp envelope of smaller internal diameter and dimensioned for snug fitting engagement with the end of said anvil remote from the lamp envelope, said tube intermediate said axial section and the remaining axial portion of said tube being frusto-conical in contour, said frusto-conical portion being crimped against said anvil at

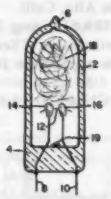


a plurality of circumferentially spaced points, and said axial section being greater in length than the diameter of said tube.

3,955,912
TEST PHOTOFLASH LAMP

Donald E. Armstrong, Williamsport, Pa.; Thomas B. McDonough, Fremont, N.H.; John W. Shaffer, Williamsport, and Ronald E. Sindlinger, Muncy, both of Pa., assignors to GTE Sylvania Incorporated, Montoursville, Pa.

Filed May 31, 1974, Ser. No. 475,348
Int. Cl.² F21K *5/02*
U.S. Cl. 431—95 R **13 Claims**



1. A test photoflash lamp comprising:
an hermetically sealed, light-transmitting envelope;
a combustion-supporting gas in said envelope;
a quantity of filamentary metallic combustible material located in said envelope;
ignition means attached to said envelope and disposed in operative relationship with said filamentary combustible material, said ignition means including primer material; and
a selected quantity of readily ignitable, hydrogen-containing solid fuel means located within said envelope separately from said primer material and said filamentary metallic combustible material for controllably inducing bursting of said lamp upon ignition to thereby test the relative strength and reliability of containment of said lamp.

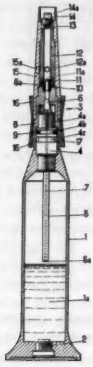
3,955,913
SELF-CONTAINED GAS TORCH

Clement Benzaria, 1, Rue de Clieu, 76200 Dieppe, France

Filed Oct. 29, 1974, Ser. No. 518,901
Claims priority, application France, Oct. 29, 1973, 73.38543; May 7, 1974, 74.15748
Int. Cl.² F23D *13/04*
U.S. Cl. 431—344 **7 Claims**

1. In a self-contained, gas-fired, hand torch comprising a reservoir for liquefied gas and a burner fitted with an air intake adjustment and a gas intake adjustment, the improvement according to which said torch comprises a gas inlet tube

leading from said reservoir toward said burner with the reservoir end of said tube located substantially at the center of



volume of the gas reservoir so that no liquefied gas will contact said reservoir end of said tube so long as said reservoir is less than half full of said liquefied gas.

3,955,914

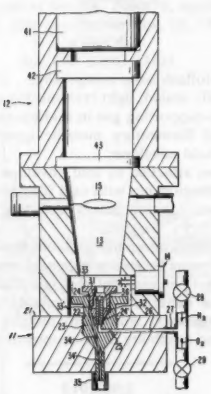
FLAME PHOTOMETRIC DETECTOR EMPLOYING PREMIXED HYDROGEN AND OXYGEN GASES

Richard Brandt DeLew, Corte Madera, Calif., assignor to Varian Associates, Palo Alto, Calif.

Division of Ser. No. 389,614, Aug. 20, 1973, Pat. No. 3,879,126, which is a continuation of Ser. No. 232,926, March 8, 1972, abandoned. This application Jan. 15, 1975, Ser. No. 541,320

Int. Cl.² F23D *15/02*

U.S. Cl. 431—353 **5 Claims**



1. A spectral flame burner for the detection of phosphorus and sulphur in a sample gas, said burner comprising a hollow cylindrical flame tip member, means for transmitting a mixture of combustible and combustion-supporting gases through said said flame tip member to the region adjacent one end of said flame tip member, said gaseous mixture being capable of supporting a hydrogen-rich flame in said region adjacent said flame-supporting end of said flame tip member, means defining a passageway extending around said flame-supporting end of said flame tip member whereby said flame can be maintained within said passageway, and means for transmitting said sample gas into said passageway to the side peripheral region of said hydrogen-rich flame, there being no communication between said means for transmitting said mixture of combustible and combustion-supporting gases and said means for transmitting said sample gas except in said region adjacent said flame-supporting end of said flame tip member.

3,955,915

THERMAL TREATMENT OF GRANULAR OR LUMPY MATERIAL, PARTICULARLY FIRING LIME, DOLOMITE, MAGNESITE OR THE LIKE

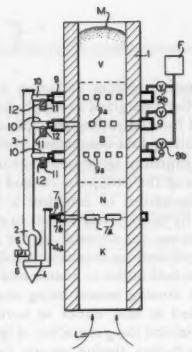
Heinrich Buchner, Niederkassel, Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne, Germany

Filed Dec. 23, 1974, Ser. No. 536,933

Claims priority, application Germany, Dec. 24, 1973, 2364626

Int. Cl.² F27B *15/18*

U.S. Cl. 432—17 **35 Claims**



1. A method of thermal treatment of granular and/or lumpy material, in particular for calcining of limestone, dolomite, magnesite, and the like, in a vertical tubular wall stack furnace chamber, and including loading the material to be treated into the top of the furnace chamber to move as a column downwardly throughout the length of the chamber, introducing air into the column into the lower end of the furnace chamber and effecting counterflow movement of the air upwardly in the furnace chamber through a cooling zone in the lower part of the chamber and then through a combustion zone in an intermediate part of the chamber and thereabove through a preheating zone in the upper part of the chamber, the improvement comprising:

withdrawing a minor preheated part of the volume of air which is introduced into the cooling zone, while permitting the major remaining volume of the air to flow on upwardly through the material column in the furnace chamber;

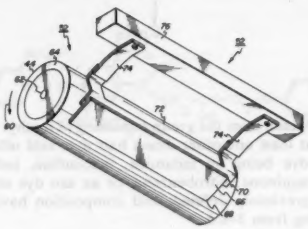
introducing through the wall of the furnace stack about the combustion zone fuel to support combustion in the combustion zone; and

returning substantially all of the withdrawn preheated air into the combustion zone with the fuel to enhance combustion efficiency in the combustion zone.

3,955,916
FUSER ROLL SHEET STRIPPING APPARATUS

Ari Bar-on, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 13, 1975, Ser. No. 540,640
Int. Cl.² B65H 29/54
U.S. Cl. 432—60 **10 Claims**



1. An apparatus for separating a moving sheet of support material having particles thereon from a heated fuser member operatively associated with a back up member wherein the sheet of support material passes therebetween with the particles thereon contacting the fuser member, including:

a blade member;

a support member;

a leaf spring having the trailing marginal edge portion thereof secured to said support member; and

a Z-shaped bracket having the trailing marginal edge portion thereof secured to the leading marginal edge portion of said leaf spring, said Z-shaped bracket having the leading marginal edge portion thereof secured to the trailing marginal edge portion of said blade member.

3,955,917
KILNS

Miroslav Kratochvil, Bondi Junction, Australia, assignor to R.M.C. Transport (New South Wales) Pty. Limited, Sydney, Australia

Continuation-in-part of Ser. No. 431,879, Jan. 9, 1974, abandoned. This application Mar. 25, 1975, Ser. No. 561,678
Int. Cl.² F27B 7/02
U.S. Cl. 432—106 **13 Claims**

1. A rotating kiln comprising:

a first rotating chamber having an upper end and a lower end;

a second rotating chamber having an upper end and a lower end;

said first and second chambers being substantially cylindrical and said chambers having colinear axes which slope downwardly toward the horizontal to provide gravity feed for material passing through said chambers;

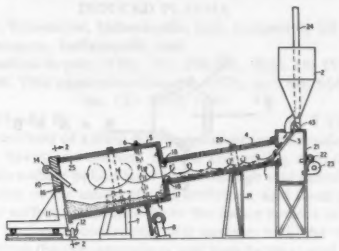
said first chamber being positioned at a higher elevation than said second chamber;

means for the introduction of material to be processed into said upper end of said first chamber;

a closed connection defining an opening between said lower end of said first chamber and said upper end of said second chamber for the passage of material from said first chamber to said second chamber while excluding the entry of air through said closed connection into said chambers;

said second chamber having a diameter which is substantially greater than the diameter of said first chamber;

said second chamber having an upper end wall positioned



about said closed connection between said first and second chambers;

said upper end wall defining an annular reflecting surface having a substantial area with respect to the opening formed by the closed connection between said first and second chambers;

burner means positioned to introduce combustible gases into the said second chamber in supplying heat to said second chamber, and

said annular reflecting surface positioned in exposed relationship with respect to said burner means to reflect a substantial quantity of heat back into said second chamber,

whereby said second chamber is maintained at a higher temperature than said first chamber such that material being treated undergoes a rapid temperature rise as the material moves from the first chamber into the second chamber.

3,955,918

AZO DERIVATIVES OR PYRIDINE N-OXIDE FOR USE IN HAIR DYE COMPOSITIONS

Gerard Lang, Epinay-sur-Seine, France, assignor to Societe Anonyme dite: L'Oreal, Paris, France

Filed June 18, 1973, Ser. No. 370,651

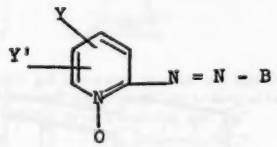
Claims priority, application France, June 19, 1972, 72.65539

Int. Cl.² D06P *3/06*

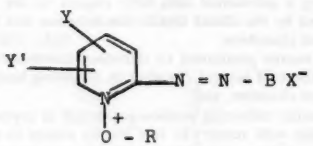
U.S. Cl. 8—10 **4 Claims**

1. A dye composition for human hair comprising a solution in a solvent selected from the group consisting of water and a hydroalcoholic solution of about 0.001–1 percent by weight of at least one dye selected from the group consisting of

1. a dye having the formula



2. a dye having the formula



and mixtures thereof, wherein

Y and Y′ each independently represent a member selected from the group consisting of hydrogen, halogen, nitro and lower alkyl having 1–4 carbon atoms;

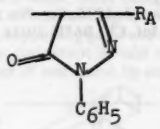
R represents lower alkyl having 1–4 carbon atoms;

X^- represents an anion, said anion being perchlorate or alkylsulfate;

B represents a member selected from the group consisting of

a. phenyl substituted in a position selected from the group consisting of ortho and para positions relative to the nitrogen atom of the disazo link, by a member selected from the group consisting of hydroxy, primary amino, tertiary amino and mixtures thereof, said substituted phenyl (1) being optionally further substituted by a substituent selected from the group consisting of lower alkyl having 1–4 carbon atoms, lower alkoxy having 1–4 carbon atoms, halogen, primary amino, tertiary amino, acetamido, nitro, hydroxy and mixtures thereof or (2) being condensed with benzene, pyridine or morpholine ring; and

b. a group of the formula



wherein

R_4 is selected from the group consisting of methyl and ethyl and at least one other direct hair dye, said other direct hair dye being an indamine, indoaniline, indophenol, anthraquinone, nitrobenzene, or an azo dye other than that previously defined, said composition having a pH ranging from 3–9.5.

3,955,919

DYESTUFF MIXTURES AND PROCESS FOR DYEING POLYESTER FIBER THEREWITH

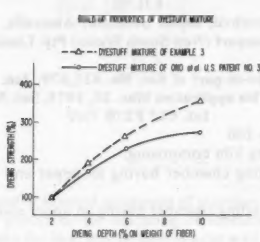
Fumio Fujii; Ken Mukai; Tetsuo Watanabe, and Hiroshi Aiga, all of Omuta, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Continuation-in-part of Ser. No. 85,234, Oct. 29, 1970, abandoned. This application Apr. 10, 1973, Ser. No. 349,773

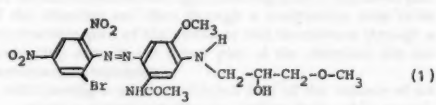
Claims priority, application Japan, Nov. 5, 1969, 44-88046; Nov. 5, 1969, 44-88048; June 23, 1970, 45-54012

Int. Cl.² C09B *27/00*, *45/48*; D06P *1/00*, *3/00*

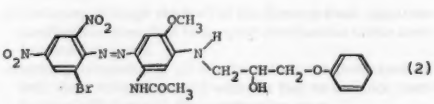
U.S. Cl. 8—26 **5 Claims**



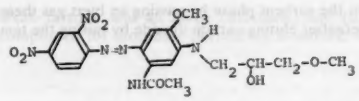
1. A mixture of dyestuffs of the formulae (1)–(4)



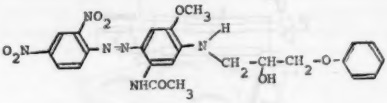
(1)



(2)



(3)



(4)

wherein each constituent dyestuff is present in an amount of at least 5% by weight.

3,955,920

WASHING PROCESS WITH ACID MONOMER GRAFTED CELLULOSE FABRIC IN BATH TO ABSORB METAL CATIONS HARDENING WATER

Carl Heinrich Krauch, Neuss; Axel Sanner, Ludwigshafen; Guenter Jakobi, Hilden, and Edmund Schmadel, Mettmann, all of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf, Germany

Filed Mar. 30, 1973, Ser. No. 346,626

Claims priority, application Switzerland, Mar. 30, 1972, 4825/72

Int. Cl.² D06L 1/12

U.S. Cl. 8—137 **5 Claims**

1. A process for washing textiles in the presence of a water insoluble cation exchanger which comprises washing textile articles in a body of water containing hardness ions and having therein a piece of fibrous poromeric material serving as a cation exchanger for water hardness ions, said poromeric material having been made by a process comprising the steps of:

A. impregnating a fibrous web structure with a liquid containing (1) a monomer mixture of at least 0.1% w/w of a polyethylenically unsaturated polymerizable monomer having at least two double bonds, which monomer can be polymerized by free radicals, with one or more monoethylenically unsaturated, copolymerizable monomers, said last mentioned monomers including a member selected from the group consisting of acrylic acid, methacrylic acid and maleic acid, (2) both said monomer mixture (1) and a polymer having a molecular weight of more than 10,000 in liquid solution or liquid dispersion, said polymer being a homopolymer or copolymer of a member selected from the group consisting of acrylic acid, methacrylic acid and maleic acid, or (3) both acrylic acid and polyacrylic acid, the total amount of the acrylic acid, methacrylic acid or maleic acid in said monomers and polymers of (1), (2) or (3) being an amount sufficient to provide in said poromeric material at least one milliequivalent of carboxyl groups per gram of poromeric material,

B. cooling the resulting impregnated web structure to a temperature at which at least 50% w/w of the liquid used to impregnate said web structure solidifies by freezing thereof,

C. irradiating the resulting frozen web structure of step (B) with either electromagnetic irradiation having a wavelength of less than 0.70 μm or with electron beams to cause polymerization of said monomers in the frozen composition.

D. then melting the resultant frozen liquid in the solidified structure to produce a poromeric polymer composition containing said liquid,

E. separating the poromeric material from said liquid and drying said poromeric material and

F. converting the carboxyl groups of the acrylic acid, methacrylic acid or maleic acid units in said poromeric material to alkali metal salt carboxylate groups.

3,955,921

METHOD OF KILLING MICROORGANISMS IN THE INSIDE OF A CONTAINER UTILIZING A LASER BEAM INDUCED PLASMA

Lowell G. Tensmeyer, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 290,303, Sept. 19, 1972, abandoned. This application Oct. 15, 1974, Ser. No. 514,673

Int. Cl.² A61L 1/00

U.S. Cl. 21—54 R **7 Claims**

1. The method of killing microorganisms in the inside of a container having an opening therein comprising directing a focused ultra-short-pulsed laser beam through said opening to a focal point in the inside of said container, said focal point being at a sufficient distance from the inside surface of said container to avoid contacting said surface with the spark resulting from the convergence of said laser beam at said focal point thereof, and generating a continuous succession of individual ultra-short-lived plasmas in the inside of said container by repeatedly sparking said laser beam therein, said individual plasmas having an accumulated life of from about one microsecond to about 50 milliseconds.

3,955,922

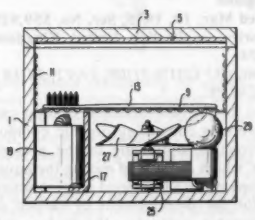
STERILIZER FOR BATHROOM ARTICLES

Le Roy Ellihue Moulthrop, Tyler, Tex., assignor to Robert J. Patch, Arlington, Va., a part interest

Filed June 6, 1975, Ser. No. 584,603

Int. Cl.² A61L 3/00, 9/04

U.S. Cl. 21—102 R **4 Claims**



1. A sterilizer for bathroom articles comprising a box having a hinged lid, a removable foraminous tray supported by the box beneath the lid for support of articles to be sterilized on the tray between the tray and the lid when the lid is closed, an electric fan in the box beneath the tray, at least one germicidal

lamp in the box beneath the tray, a mirror on the underside of said lid, said mirror serving as a vanity mirror when said lid is raised and serving to reflect ultra-violet rays from said germicidal lamp downward onto the upper sides of articles resting on the tray when the lid is closed, and apertures through opposite side walls of said box, said apertures serving on the one hand as handgrips to manipulate the box, and on the other hand as ventilating holes to permit the egress of ozone from the box.

3,955,923

SEROLOGIC REACTION METHOD

Samuel Simon Asculai, Hampton, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Jan. 13, 1973, Ser. No. 328,219

Int. Cl.² G01N *33/16*

U.S. Cl. 23—230 B **13 Claims**

1. In an immunochemical or serodiagnostic test reaction, wherein the end point is determined by the presence or absence of agglutination, which comprises reacting the body fluid to be tested with an anti-serum on a test surface and adding an antigen complex to the mixture of body fluid and anti-serum, said antigen complex consisting of solid particles coated with the antigen, the improvement which comprises performing the test on a test surface having a concave curvature sufficient to produce a discernible pattern at the end point where agglutination occurs, the absence of said pattern being an indication of the inhibition of agglutination by the soluble antigens present in the body fluid, said test surface being a portion of a sphere having a depth from about 3.08 mm. to about 7.30 mm. and a diameter between about 40 mm. and 65 mm.

3,955,924

METHOD FOR THE DETERMINATION OF TOTAL CARBON IN AQUEOUS SOLUTIONS

Barry Robert Northmore, Epsom; Kevin John Saunders, Tadworth, and Derek Chester White, New Malden, all of England, assignors to The British Petroleum Company Limited, London, England

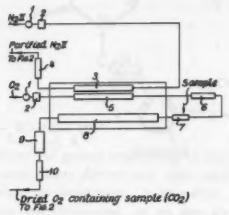
Filed Mar. 19, 1975, Ser. No. 559,929

Claims priority, application United Kingdom, Mar. 22, 1974, 12792/74

Int. Cl.² G01N *31/08, 31/12, 33/18*

U.S. Cl. 23—230 PC **20 Claims**

1. A method for the determination of total carbon present in aqueous solutions containing organic compounds and/or inorganic carbonates, optionally in the presence of other inorganic salts, which consists of mixing the aqueous solution at ambient temperature with a solid reagent active at elevated temperature for the displacement of carbon dioxide from inorganic carbonates, contacting the mixture with oxygen at elevated temperature whereby carbon dioxide is produced by oxidation of organic compounds and by displacement from any inorganic carbonates present, drying the carbon dioxide so produced, collecting at least all the carbon dioxide in the gaseous mixture by passing the mixture at low temperature through a column packed with a sorbent phase which selectively retards the passage of carbon dioxide, displacing the oxygen from the sorbent phase by passing an inert gas therethrough, thereafter eluting carbon dioxide by raising the temperature and passing inert gas in the reverse direction and finally quantitatively measuring the eluted carbon dioxide.



3,955,925

PREPARATION OF OPTICALLY CLEAR SERUM

Gary J. Proksch, 1045 W. 77th St., South Drive, and Dean P. Bonderman, 586 W. 77th Drive, North, both of Indianapolis, Ind. 46260

Continuation of Ser. No. 414,799, Nov. 12, 1973, abandoned. This application June 13, 1975, Ser. No. 586,569

Int. Cl.² G01N *33/16*

U.S. Cl. 23—230 B **19 Claims**

1. A process for preparing a lyophilized serum standard or reference material for the assay of human blood comprising:

a. mixing human serum with a metal cation selected from the group consisting of calcium, manganese and magnesium;

b. adding to the serum containing said added metal cation a quantity of polysulfate sufficient to precipitate a lipoprotein-polysulfate complex said polysulfate being a polymer having a molecular weight of at least 10,000 and having at least one sulfate group per monomer;

c. removing said lipoprotein-polysulfate complex precipitate from the serum; and

d. lyophilizing the serum from which said lipoprotein-polysulfate complex has been removed.

3,955,926

PROCESS AND QUICK-ACTION REAGENT FOR THE DETECTION OF NARCOTICS

Wolfgang Fischer, Darmstadt, Germany, assignor to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Filed Feb. 12, 1973, Ser. No. 331,596

Claims priority, application Germany, Feb. 12, 1972, 2206697

Int. Cl.² G01N *21/06, 33/16*

U.S. Cl. 23—230 B **3 Claims**

1. In a process for the detection of narcotics by dissolution of the unknown in a solvent for the narcotic and contacting the solution with a multi-component color reagent for the narcotic, the improvement wherein (a) samples of the unknown are separately tested for heroin and for morphine derivatives with a multi-component reagent for heroin and a multi-component reagent for morphine derivatives, (b) at least one component of each of said reagents is in dry form impregnated in an absorbent support and the remaining component thereof is in liquid form, (c) the component of the reagent for heroin in liquid form is a solution of benzylamine and iodic acid in dilute acid and the dry component thereof is an absorbent support impregnated with ferric chloride, an

alkali tartrate and an alkali carbonate, and (d) the liquid component for morphine derivatives is sulfuric acid and the

dry component thereof is an absorbent support impregnated with hexamethylenetetramine.

3,955,927

TRACE LEAD ANALYSIS METHOD

Catherine A. Zelaskowski, Trenton, N.J., and John J. Carlisi, Langhorne, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 371,338, June 18, 1973, abandoned. This application Feb. 12, 1975, Ser. No. 549,221

Int. Cl.² G01N *31/22, 33/22*

U.S. Cl. 23—230 R **8 Claims**

1. A method for colorimetrically determining the lead content in gasoline by converting the tetraalkyllead in a gasoline to a dialkyllead diiodide comprising reacting the tetraalkyllead with iodine and exposing the resulting reaction mixture to ultraviolet radiation of 2800A to below 4000A whereby said dialkyllead diiodide is formed, adding a pyridylazo hydroxyaryl compound in aqueous solution to the gasoline to produce a color in the aqueous phase corresponding to the initial lead concentration.

3,955,928

PREGNANCY TEST

Hugh Yee, 4201 Frostwood, Troy, Mich. 48084

Filed Aug. 15, 1975, Ser. No. 604,926

Int. Cl.² G01N *21/14, 31/02, 31/08, 33/16*

U.S. Cl. 23—230 B **15 Claims**

1. A process for determining pregnancy by measurement of the estrogens present in urine, comprising the steps of:

a. separating the estrogen steroids from the urine;

b. hydrolyzing the separated estrogen steroids;

c. extracting the estrogen steroids from the urine;

d. forming the estrogen steroid extract into chromogens; and

e. evaluating the concentration of the estrogen steroids by spectrophotometric measurements.

3,955,929

GAS DETECTING SENSOR

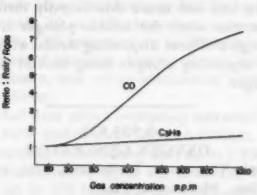
Takaya Kawakami; Toshinori Kitamura, both of Kyoto, and Nobuyuki Yamaji, Takatsuki, all of Japan, assignors to Nichicon Capacitor Limited, Kyoto, Japan

Filed Oct. 18, 1974, Ser. No. 515,887

Claims priority, application Japan, Oct. 19, 1973, 48-117444

Int. Cl.² G01N *27/04, 27/14*

U.S. Cl. 23—254 E **6 Claims**



1. A gas detecting means comprising SnO_2 containing from more than 0% by weight to less than 5% by weight of at least one material selected from the group consisting of Al_2O_3, ZnO, SrO and BaO and from more than 0% by weight to less than 1% by weight of chlorine.

3,955,930

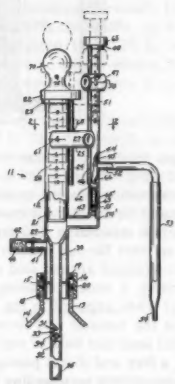
AUTOMATIC DILUTOR HAVING COUPLED DILUENT AND REAGENT PLUNGERS

Justin Joel Shapiro, 1802 Second St., Berkeley, Calif. 94710

Filed Apr. 7, 1975, Ser. No. 565,569

Int. Cl.² B01L *3/02*; **G01F** *11/06*

U.S. Cl. 23—259 **15 Claims**



1. A reagent dilutor comprising an upright diluent barrel having a lower intake portion provided with suction-responsive, upwardly-opening first check valve means and having an upper portion, means to operatively engage said intake portion in a diluent container, a diluent dispensing plunger in the upper portion of said barrel and having a lowermost position, means limiting the upward extension of said diluent dispensing plunger, a branch conduit connected to said barrel subjacent the lowermost position of the bottom end of the plunger, an upright reagent aspirating barrel, means including bottom pressure-responsive, upwardly-opening second check valve means connecting said branch conduit to the bottom end of said reagent aspirating barrel, biasing means acting on said second check valve means to prevent its opening when the diluent dispensing plunger is moved upwardly, a reagent aspirating plunger in said reagent aspirating barrel and having a

lowermost position therein, means limiting the upward extension of said reagent aspirating plunger, the limited extension of the diluent plunger being greater than that of the reagent aspirating plunger, an open-ended conduit member connected to the lower portion of said reagent aspirating barrel above said second check valve means and subjacent the lowermost position of the bottom end of the reagent aspirating plunger, and means fixedly secured to one plunger and yieldably connected to the other plunger, whereby the reagent aspirating plunger will move upwardly through a reagent intake stroke when the diluent plunger is moved upwardly through a diluent intake stroke and will move downwardly through a reagent dispensing stroke when the diluent plunger is moved downwardly through a diluent dispensing stroke with the strokes of the reagent aspirating plunger being shorter than that of the diluent plunger.

3,955,931

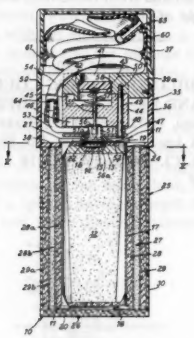
OXYGEN GENERATOR

Tommy Lewis Thompson, Melbourne, Fla., assignor to Life Support, Inc., Melbourne, Fla.

Filed Feb. 19, 1974, Ser. No. 443,238

Int. Cl.² A61M *15/00, 16/00;* **A62B** *7/08;* **B01J** *7/00*

U.S. Cl. 23—281 **9 Claims**



1. An oxygen generator canister which comprises a metal can having end walls with an orifice in one end wall, an oxygen generating composition housed in said canister which upon ignition undergoes an exothermic reaction with the evolution of oxygen, ignition material in said canister for activating said composition, an inert fibrous blanket containing a means for removing heat wrapped around said can, said heat removing means comprising a water releasing hydrate, said hydrate releasing water when exposed to the heat of reaction of said composition in the canister and forming a vapor which will convert sensible heat into heat of vaporization; and said blanket providing a free and direct passage for radial flow of the vapor to the atmosphere surrounding the blanket whereby the generator canister may be grasped by a user without discomfort from heat generated by the composition.

3,955,932

INERT GAS GENERATOR

Georg Michael Meyer, Meerbusch Langst-Kierst, Germany, assignor to Deutsche Babcock & Wilcox Aktiengesellschaft, Oberhausen, Germany

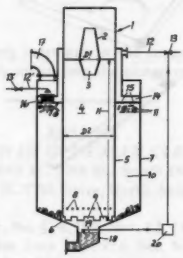
Filed Dec. 11, 1973, Ser. No. 425,685

Claims priority, application Germany, Dec. 13, 1972, 2260871

Int. Cl.² B01J *7/00*

U.S. Cl. 23—281 **5 Claims**

1. An inert gas generator comprising a cylindrical housing having its axis vertically disposed, a cylindrical firing chamber enclosed by a cylindrical firing chamber wall of heat resistant steel within said housing having a diameter smaller than the diameter of said housing to thereby define an annular chamber between said firing chamber wall and said housing, said annular chamber having an upper end portion and a lower end portion, said firing chamber wall having an upper end portion and a lower end portion, said lower end portion of the firing chamber wall having a lower edge, a rotationally symmetric burner having a vertically disposed axis, said burner being located above said cylindrical firing chamber and having a burner tip directed downwardly into said firing chamber, means for supplying combustibles to said burner, said firing chamber wall having a diameter greater than the diameter of said burner, communicating means at said lower end portion



of said firing chamber wall providing communication between said firing chamber and said annular chamber such that inert gas can pass from said firing chamber to said annular chamber, a wash water inlet means at said upper end portion of said annular chamber, said cylindrical housing having a funnel-shaped bottom having a central wash water outlet, said lower edge of said firing chamber wall being disposed on said funnel-shaped bottom of said cylindrical housing such that said firing chamber wall is thereby supported on said funnel-shaped bottom, said lower edge of said firing chamber wall having recesses for passing wash water from said lower end portion of said annular chamber to said wash water outlet, and a gas outlet means at said upper end portion of said annular chamber.

3,955,933

MAGNESIUM-BORON PARTICULATE COMPOSITES

Oleg D. Sherby, Palo Alto, Calif.; Irvin C. Huseby, Stuttgart, Germany; Robert Whalen, La Plata, Argentina, and Steven L. Robinson, Palo Alto, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 230,396, Feb. 29, 1972, abandoned, and a continuation-in-part of Ser. No. 355,268, Feb. 26, 1973, Pat. No. 3,827,921. This application May 23, 1974, Ser. No. 472,577

Int. Cl.² B22F *3/00, 5/00;* **C22C** *23/00*

U.S. Cl. 29—182.5 **7 Claims**

1. A sintered magnesium-boron powdered composite alloy comprising:

a. magnesium;

b. boron;

c. lithium, said lithium being about 14 percent by weight of said magnesium; and

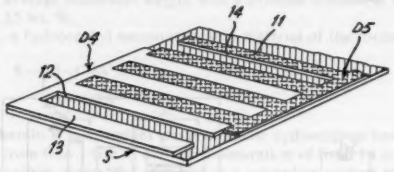
d. said boron comprising from about 5 percent by volume to about 30 percent by volume.

3,955,934

SEMIMANUFACTURED PRODUCT FOR USE IN JEWELRY

Valtiero Tizzi, 43 Via Bastioni Settentrionali, Rimini, Italy (47037)

Filed Oct. 29, 1973, Ser. No. 410,360
Claims priority, application Italy, Nov. 13, 1972, 13004/72
Int. Cl.[2] B32B *15/00*; A44C *25/00*
U.S. Cl. 29—191 9 Claims



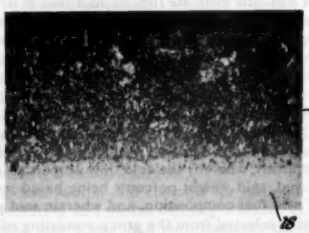
1. A semimanufactured jewelry product, comprising an essentially flat elongated support band of metal presenting substantially two opposed faces, and two essentially flat decorating bands of metal, each presenting substantially two opposed faces, the two said decorating bands being essentially co-planar and both being secured, by one of their faces, onto the same one face of the support band, each one of said decorating bands being provided with apertures which extend transversely to same and to the support band and open out of one longitudinal edge of that said band, so as to confer to that said decorating band a comb-like structure comprising a longitudinal side strip extending longitudinally on the elongated support band and a row of aligned teeth, the teeth of one comb-like structure decorating band extending from its strip transversely of the elongated support band for a major portion of the width of the strip into the apertures between the teeth of the other opposed and co-planar comb-like structure of the other decorating band, the thickness of the decorating bands in the finished semimanufactured product being substantially the same as when originally applied to the support band.

3,955,935

DUCTILE CORROSION RESISTANT CHROMIUM-ALUMINUM COATING ON SUPERALLOY SUBSTRATE AND METHOD OF FORMING

Quentin O. Shockley, Indianapolis, and James O. Hodshire, Mooresville, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 27, 1974, Ser. No. 527,611
Int. Cl.[2] B23P *3/00*; C25D *13/02*
U.S. Cl. 29—194 4 Claims



1. A method of forming a ductile, corrosion resistant coating on a cobalt base superalloy or nickel base superalloy substrate comprising:

electrophoretically codepositing a mixture containing, on a proportional weight basis, 3 to 4 parts elemental aluminum powder and one part of an alloy powder consisting essentially by weight of 70 to 80% chromium and the balance aluminum on a surface portion of a preformed article, made of a high temperature resistant alloy taken from the group consisting of cobalt base alloys and nickel base alloys, to form a porous coating of said mixture on said article and

heating said article and coating at a temperature of about 1,900° F. in a protective atmosphere for at least about five hours whereby the aluminum and the chromium-aluminum alloy, interdiffuse with said substrate to form a ductile, corrosion resistant coating,

said cobalt base alloys consisting essentially by weight of 50 to 75% cobalt, 20 to 30% chromium, up to about 10½% nickel, up to 11% tungsten, up to 7% by weight total of one or more of titanium, boron, silicon, iron, tantalum and columbium, and minor amounts of carbon, manganese and silicon,

and said nickel base alloys consisting essentially by weight of 40 to 80% nickel, 5 to 20% chromium, up to 10% molybdenum, up to 5.5% titanium, up to 6.5% aluminum, up to 3% columbium, up to 9% tantalum, up to 13.5% tungsten, up to 2% hafnium, up to 1% rhenium, up to 1.5% vanadium, up to 20% cobalt, up to 3% iron, and minor amounts of carbon, boron, zirconium, silicon and manganese.

3. A heat and corrosion resistant article comprising a cobalt base alloy or nickel base alloy substrate and an aluminum-chromium diffusion coating ½ to 5 mils in thickness on said substrate,

the diffusion coating being the diffusion product of heating, at about 1,900° F. in a protective atmosphere, the substrate and a powder metal mixture electrophoretically applied thereto, the metal content of the mixture initially consisting essentially, on a proportional weight basis, of 3 to 4 parts aluminum powder and one part of an alloy powder consisting essentially by weight of 70 to 80% chromium and the balance aluminum,

said cobalt base alloy consisting essentially by weight of 50 to 75% cobalt, 20 to 30% chromium, up to about 10½% nickel, up to 11% tungsten, up to 7% by weight total of one or more of titanium, boron, silicon, iron, tantalum and columbium, and minor amounts of carbon, manganese and silicon,

and said nickel base alloy consisting essentially by weight of 40 to 80% nickel, 5 to 20% chromium, up to 10% molybdenum, up to 5.5% titanium, up to 6.5% aluminum, up to 3% columbium, up to 9% tantalum, up to 13.5% tungsten, up to 2% hafnium, up to 1% rhenium, up to 1.5% vanadium, up to 20% cobalt, up to 3% iron, and minor amounts of carbon, boron, zirconium, silicon and manganese.

3,955,936

HEAVY-DUTY ALUMINUM BEARING ALLOY

Gordon J. LeBrasse, and Austin H. Beebe, Jr., both of Ann Arbor, Mich., assignors to Federal-Mogul Corporation, Southfield, Mich.

Filed Feb. 13, 1974, Ser. No. 442,064
Int. Cl.[2] B32B *15/20*
U.S. Cl. 29—197 4 Claims

1. A composite heavy-duty bearing material possessed of improved fatigue resistance comprising a high-strength backing strip having a bearing lining tenaciously bonded to at least one face surface thereof, said bearing lining consisting essentially of about 2.5% to about 3.5% cadmium, about 1.0% to about 1.5% copper, about 0.75% to about 1.25% nickel, about 1.25% to about 1.75% manganese, and the balance aluminum including incidental impurities and residuals present in conventional quantities.

3,955,937
IGNITOR CHARCOAL AND METHOD OF MANUFACTURE THEREOF

Kyu Bong Whang, Central P.O. Box No. 5593, Seoul, South Korea

Continuation-in-part of Ser. No. 288,983, Sept. 14, 1972, abandoned. This application Oct. 10, 1974, Ser. No. 513,770
Claims priority, application Republic of Korea, Mar. 29, 1974, 2016/73
Int. Cl.² C10L 5/02, 11/00
U.S. Cl. 44—17 **1 Claim**

1. A method of making ignitor-briquettes, comprising the steps of:
   a. immersing a soft-tissue combustible material selected from the group consisting of pulp, ground sawdust, wood powder and chopped paper in an aqueous solution of nitre comprising at least one oxidizing agent selected from the group consisting of potassium nitrate, sodium nitrate, and potassium permanganate;
   b. drying said solution;
   c. after drying, sprinkling said oxidizing agent-impregnated soft-tissue combustible onto a charred carbon combustible powder material selected from the group consisting of charcoal and charred sawdust spread flat;
   d. thereafter mixing said impregnated soft-tissue combustible and said charred carbon powder together;
   e. adding to the mixture from step (d) a binder solution of resin;
   f. compressing the mixture from step (e) into a substantially solid unit of predetermined shape; and
   g. applying a coating of said resin solution to the exterior surface of said substantially solid unit from step (f).

3,955,938
GASOLINE COMPOSITION CONTAINING A SODIUM ADDITIVE

John P. Graham, San Antonio, Tex.; Jack Ryer, East Brunswick, N.J., and Sidney J. Lestz, San Antonio, Tex., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Aug. 21, 1973, Ser. No. 390,308
Int. Cl.² C10L 1/32
U.S. Cl. 44—51 **1 Claim**

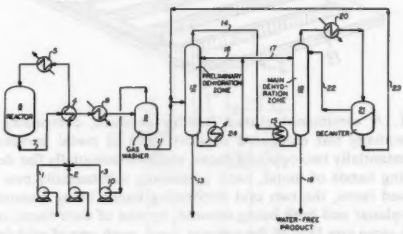
1. A lead-free gasoline composition comprising a major proportion of gasoline having a total metal content of less than about 2 parts per million of lead and about 1.7 to 13.6 parts per million of sodium; said sodium being present in the form of a sodium additive effective in inhibiting valve seat recession and in an amount equivalent to about 0.5 to about 4 pounds of sodium per thousand barrels of gasoline; said sodium additive being a colloidal dispersion of sodium carbonate formed by adding carbon dioxide and an aqueous solution of sodium hydroxide to an oil solution of: a P_2S_5 treated polyisobutylene having a molecular weight in the range of about 700–100,000 as a surfactant, and an alkyl phenol having a molecular weight in the range of about 200 to 700 as a promoter; and heating to dehydrate the resulting mixture and to form said sodium additive.

3,955,939
EXTRACTIVE DISTILLATION OF ISOPROPYL ALCOHOL WITH AN ETHER SOLVENT RECOVERED FROM THE INITIAL FEED

August Sommer, Herne, and Martin Urban, Gelsenkirchen-Buer, both of Germany, assignors to Veba-Chemie AG, Gelsenkirchen-Buer, Germany

Filed Oct. 4, 1973, Ser. No. 403,688
Claims priority, application Germany, Oct. 5, 1972, 2248841
Int. Cl.² C10L 1/02
U.S. Cl. 44—53 **3 Claims**

1. Process for recovering a water-free mixture of isopropyl alcohol, diisopropyl ether and, as by-products, n-propanol, acetone, hexanol and hydrocarbons, from the catalytic hydration of propylene in the gaseous phase at temperatures of 140°–170°C and pressures of 25–40 atmospheres gauge which consists essentially of:
   a. conducting the hydration reaction with a water-to-propylene molar ratio of 0.1 to 0.25 to produce a crude reaction product mixture containing water, isopropyl alcohol, diisopropyl ether and said by-products;
   b. concentrating the crude reaction product from (a) by distillation in a first column, withdrawing water as the sump product until the mixture is close to the azeotropic concentration of the isopropyl alcohol-water azeotrope; and



   c. extractively distilling at least a portion of the concentrated mixture from (b) in a second column withdrawing said water-free mixture as the sump product and a mixture consisting of diisopropyl ether and said by-products formed in hydration step (a) prior to steps (b) and (c) and recycling said mixture of diisopropyl ether and by-products to the top of said second column, said diisopropyl ether formed exclusively as a byproduct of the hydration reaction serving as the extracting agent for the distillation in the second column, while eliminating the need for an external source of diisopropyl ether make-up.

3,955,940
MIDDLE DISTILLATE PETROLEUM OILS CONTAINING COLD FLOW IMPROVING ADDITIVES

William C. Hollyday, Jr., Watchung, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

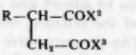
Filed Jan. 6, 1975, Ser. No. 538,931
Int. Cl.² C10L 1/22, 1/14, 1/18
U.S. Cl. 44—62 **16 Claims**

1. A middle distillate fuel composition comprising a major amount of a middle distillate fuel oil improved in its cold flow properties by a flow-improving amount of the combination of: from about 0.0005 to 0.10 weight percent of a C_8 to C_{30} dialkyl secondary amine with each alkyl group being straight chain; from about 0.003 to 0.20 weight percent of a pour point depressant; and, from about 0.025 to 0.50 weight percent of an amorphous petrolatum having a melting point in the range of about 25° to 60°C. and a number average molecular weight in the range of about 600 to 1,100 and substantially free of normal paraffins, whereby the cold flow properties of said fuel are improved, said weight percents being based on the total weight of said fuel composition, and wherein said pour point depressant is selected from the group consisting of:
   A. oil-soluble ethylene copolymers having a number average molecular weight in the range of about 1,000 to 50,000, which are copolymers of 3 to 40 molar proportion of ethylene with a molar proportion of comonomer selected from the group consisting of (1) C_3 to C_{18} alpha monoolefin, and (2) unsaturated ester of the general formula:

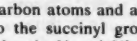
wherein R_1 is hydrogen or methyl; R_2 is a $—OOCR_4$ or $—COOR_4$ group wherein R_4 is hydrogen or a C_1 to C_{16} alkyl group; and R_3 is hydrogen or $—COOR_4$;

B. chlorinated polyethylene of 1,000 to 20,000 number average molecular weight with a chlorine content of 4 to 35 wt. %;

C. a hydrocarbyl succinamic acid material of the formula:



wherein R is a straight chain aliphatic hydrocarbon having from 0 to 1 site of olefinic unsaturation of from 14 to 40 carbon atoms and attached at a secondary carbon atom to the succinyl group; one of X^2 and X^3 is $—NYY^1$, wherein Y and Y^1 are aliphatic hydrocarbyl groups of from 14 to 40 carbon atoms, the other of X^2 and X^3 is of the formula:



wherein n varies from 0 to 1, Y^2 and Y^3 are hydrogen, aliphatic hydrocarbon of from 1 to 30 carbon atoms or oxyaliphatic hydrocarbon of from 1 to 30 carbon atoms, and may be taken together with the nitrogen to which they are attached to form a heterocyclic ring of from five to seven annular members; and

D. hydrogenated copolymer of butadiene and styrene.

3,955,941

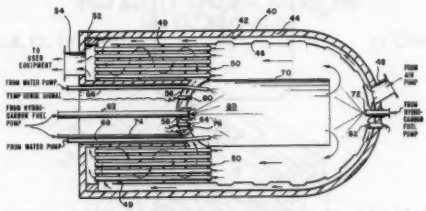
HYDROGEN RICH GAS GENERATOR

John Houseman, Pasadena; Jack H. Rupe, Sunland, and Raymond O. Kushida, Los Angeles, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Continuation of Ser. No. 390,049, Aug. 20, 1973, abandoned. This application Feb. 10, 1975, Ser. No. 548,559

Int. Cl.² C10J *3/00*

U.S. Cl. 48—95 **13 Claims**



1. A hydrogen rich gas generator comprising

means for defining a source of air,

means for defining a source of hydrocarbon fuel,

means for defining a source of water,

walls defining a closed chamber,

means located within said chamber for mixing a hydrocarbon fuel from said means defining a source of hydrocarbon fuel with a less than stoichiometric quantity of air from said means defining a source of air, to provide an air fuel mixture and for directing said mixture into an adjacent region of said chamber designated as a combustion zone,

means adjacent to said means for mixing for igniting said air-fuel mixture to form hot gases which expand within said chamber,

means within said chamber for preheating air from said means defining a source of air and applying said preheated air to said means for mixing,

means for forming water from said means defining a source of water into a spray mist,

means for injecting said spray mist directly into said hot gases at a location within said chamber adjacent to said combustion zone to form steam and for directly injecting hydrocarbon fuel from said source of hydrocarbon fuel into said hot gases to be steam reformed by said hot gases and steam into a hydrogen rich gas, said location in said chamber into which said spray mist is injected being designated as a steam reforming zone,

means for applying water from said means defining a source of water to said means for forming a spray mist, and

means for conducting said hydrogen rich gas to a collection area.

3,955,942

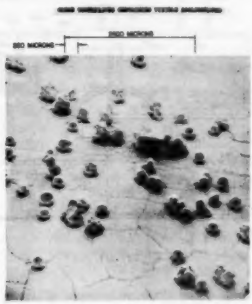
ABRASIVE AGGLOMERATES OF ABRASIVE SUBPARTICLES AND BINDER MATERIAL

Martin Cordon, Highland Park, and Brian J. Pintenich, Piscataway, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 242,964, April 11, 1972, Pat. No. 3,803,301, which is a continuation-in-part of Ser. No. 149,786, June 3, 1971, abandoned. This application Apr. 4, 1974, Ser. No. 457,934

Int. Cl.² A61K *7/16*; **B24D** *3/30, 3/32*

U.S. Cl. 51—295 **8 Claims**



1. Macroscopically visible abrasive agglomerates having dental cleaning and polishing characteristics and suitable for incorporation into a clear gel dental vehicle, each of said agglomerates having a particle size from 100 to 1,000 microns, said agglomerates consisting essentially of an outer crust including a plurality of hard abrasive subparticles having a Moh hardness of at least 5 and a mean particle diameter between 0.1 and 10 microns selected from the group consisting of zirconium silicate, silica, SnO_2, feldspar, topaz, calcium silicate, silicon carbide, pumice, alumina, ilemite, hematite, and titanium dioxide and a binding material selected from the group consisting of thermoplastic polymer and wax and an inner core substantially free of said subparticles, said subparticles and said binding agent material being present in a weight ratio of from about 1:9 to about 9:1.

3,955,943

DIFFUSION METHOD OF SEPERATING GASEOUS MIXTURES

Rex B. Pontius, Rochester, N.Y., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

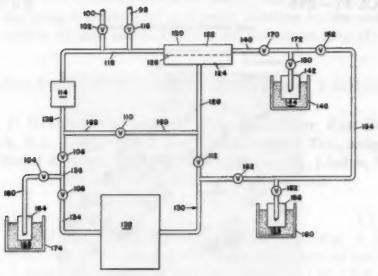
Filed June 16, 1948, Ser. No. 33,282

Int. Cl.² B01D *59/12*

U.S. Cl. 55—16 **6 Claims**

1. A method of separating and recovering in relatively concentrated form the heavier and lighter components of a

relatively small batch of gaseous mixture which comprises flowing said mixture against one face of a porous permeable membrane in a diffusion separation system to cause a first fraction of said mixture enriched with respect to the lighter component thereof to diffuse through said membrane and to cause a second fraction enriched with respect to the heavier component of said mixture to flow past said membrane without diffusing therethrough, continuously circulating the first fraction in said system to cause said first fraction to pass repeatedly into contact with said membrane, withdrawing and successively collecting the second fraction of said mixture flowing from said system in successive portions, separately collecting the light residue mixture which remains in said system, reducing the size of the system to accommodate the reduced volume of said collected light residue mixture, supplying said residue mixture to a diffusion separation membrane through the reduced diffusion system so as to cause said light residue mixture to flow into contact with the membrane whereby a lighter subfraction of said residue mixture passes through said membrane and whereby a heavier subfraction of said residue mixture flows from said membrane without diffusing therethrough, said heavier subfraction being removed from said reduced system as it flows from said membrane, said residue mixture being supplied to said smaller diffusion system



at a rate equivalent to the rate at which said heavier subfraction is withdrawn from said smaller diffusion system after having passed into contact with said membrane, causing said lighter subfraction which is diffused through said membrane to be recirculated through said reduced diffusion system and into contact with said membrane, combining said lighter subfraction as it recirculates in said smaller diffusion system with said light residue mixture entering said smaller diffusion system, stopping said recirculation in said reduced diffusion system when the concentration of the light component in said heavier subfraction which flows from said membrane without diffusing therethrough is equal to the concentration of the light component in said entering residue mixture, removing the circulating mixture from said reduced diffusion system when said concentrations are equal, enlarging the size of the system to accommodate the volume of the separately collected portions of the heavy second fraction of the original mixture, circulating the first collected portion of said second fraction against a membrane in said enlarged diffusion system so as to cause a first subfraction of said first collected portion to diffuse through said membrane and to cause a second and heavier subfraction of said first collected portion to flow from said membrane without diffusing therethrough and successively collecting as a concentrated heavy gas said subfraction in successive portions.

3,955,944

CONTROLLED SELECTIVITY ACTIVATED CARBON

Richard John Grant, Pittsburgh, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

Division of Ser. No. 402,682, Oct. 2, 1973, Pat. No. 3,884,830, which is a continuation-in-part of Ser. No. 132,217, April 7, 1971, abandoned. This application Nov. 8, 1974, Ser. No. 521,992

Int. Cl.² B01D *53/04*

U.S. Cl. 55—74 **3 Claims**

1. Method of separating components of a mixture by physical adsorption comprising contacting the mixture with a molecular sieve activated carbon in granular form for a time sufficient for the said activated carbon to adsorb and retain the readily adsorbable components of the mixture, wherein the said activated carbon is prepared by the successive steps of agglomerating pulverized charred naturally-occurring carbonaceous material with pitch, crushing the agglomerations thereof, activating the granular material thus obtained by treating it in a heating zone at from 300°C. to 400°C. for a period of at least 120 minutes with about 5 to 18 liters of air per gram of carbon, subsequently calcining it at a temperature of 850°C. to 960°C. for a period of 5 to 20 minutes, and recovering a granular, highly activated carbon having an iodine number of at least 450 and a carbontetrachloride number no greater than 2.

3,955,945

OIL SEPARATOR FOR AIR COMPRESSORS AND THE LIKE

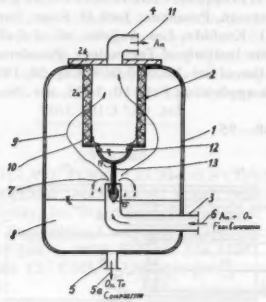
Heinz Bauer, Katharinenstr. 10, 8 Munich 71, Germany

Filed July 16, 1973, Ser. No. 379,328

Claims priority, application Austria, July 14, 1972, 6108/72

Int. Cl.² B01D *19/00, 50/00*

U.S. Cl. 55—159 **16 Claims**



1. An oil separator for returning entrained oil to a compressor delivering a flow of gas under pressure, comprising:

a housing provided with an inlet port connectable to the compressor output for receiving its gas flow, said housing being provided with a discharge port for oil to be returned to the compressor:

a separation unit removably inserted into said housing at a location above said discharge port and provided with filter means in the path of said gas flow, said unit having an outlet port for purified gas and further having a drain for oil separated from said gas; and

an extractor on said unit in direct communication with said drain for forcedly exhausting the separated oil to the interior of said housing with creation of a pressure differential across said filter means to promote the penetration thereof by said gas flow, said extractor having a driving element freely supported on said unit in the path of said gas flow for actuation thereby.

3,955,946
ADSORPTION DEVICE

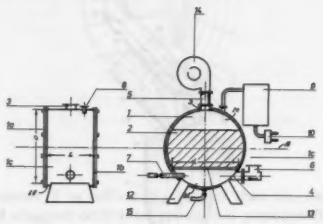
Heinrich Führing, and Emil Christof, both of Augsburg, Germany, assignors to Bowe Bohler & Weber KG Maschinenfabrik, Augsburg, Germany

Filed Apr. 3, 1973, Ser. No. 347,457

Claims priority, application Germany, Apr. 7, 1972, 2216672

Int. Cl.² B01D *53/04*

U.S. Cl. 55—179 **5 Claims**



1. An adsorption installation for the treatment of gases, comprising a plurality of cylindrical disk-shaped adsorption cells each having an axial length not exceeding its diameter and including a vessel having a horizontal axis defined between a pair of vertical planes; means in each vessel for supporting a respective body of adsorbent therein extending between the respective vertical planes, said cells being disposed in horizontal alignment and in end to end relationship with the vertical planes of adjacent cells abutting each other; means for rigidly connecting adjacent vessels of said cells together; fittings formed on said vessels above and below said bodies of adsorbent for passing a gas through said bodies within said vessels; and a pair of vertical planar end walls terminating said installation, one such end wall being fixed to the vessel of each cell at a respective end of the installation.

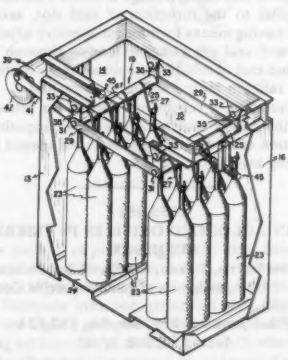
3,955,947
BAG FILTER CLEANING DEVICE

Harry E. Hoon, Elgin, Ill., and Marion C. Pogoda, Lebanon, Pa., assignors to Envirotech Corporation, Menlo Park, Calif.

Filed Nov. 13, 1974, Ser. No. 523,290

Int. Cl.² B01D *41/04*

U.S. Cl. 55—300 **21 Claims**



1. In a filtration apparatus for removing suspended particulates from gases, which apparatus has flexible bag-shaped filtering elements suspended in tension in a cleaning compartment from a rigid frame that is constructed and arranged to be driven in an oscillatory manner to shake the bag-shaped filtering elements, means for driving the rigid frame in an oscillatory manner, and an impacting device for imparting mechanical impacts against said frame as the same undergoes the oscillatory motion, said impacting device comprising:

a. a bracket that is mounted stationarily in the cleaning compartment;

b. a rigid striker member and cooperatively-associated adjustable means adjustably mounting and positioning said striker member in said bracket to extend to a location whereat an end of the striker member is impacted by the frame on the frame's oscillatory path of travel; and

c. resilient and adjustable biasing means cooperatively associated with said striker member and said adjustable mounting means for resiliently biasing the striker member relative the mounting means so that said striker member moves resiliently following an impact with the frame.

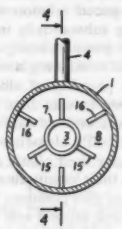
3,955,948
VORTEX SEPARATOR

Joseph Campolong, St. Petersburg, Fla., assignor to Pall Corporation, Glen Cove, N.Y.

Division of Ser. No. 360,516, May 15, 1973, Pat. No. 3,895,930, which is a continuation-in-part of Ser. No. 306,119, Nov. 13, 1972, abandoned, which is a continuation of Ser. No. 314,716, April 24, 1970, abandoned. This application Oct. 10, 1974, Ser. No. 513,694

Int. Cl.² B01D *45/12*

U.S. Cl. 55—394 **6 Claims**

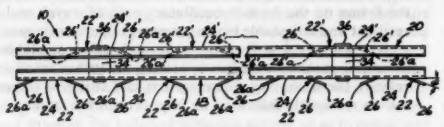


1. A vortex particle separator with provision to prevent abrasion by separated particles retained therein, and/or exhausted therefrom by scavenge flow, comprising a tubular body having an inlet at one end, an outlet at the opposite end and a central passage therebetween; a deflector coaxially mounted in the passage adjacent the inlet, having a plurality of helical vanes abutting the wall of the passage, and positioned at an angle to the line of flow from the inlet to the outlet so as to create a vortex stream in the influent air, which concentrates the contaminant particles in the whirling air stream at the periphery of the passage, thereby leaving the air at the center of the passage relatively clean; a generally tubular outlet member disposed within the central passage at the outlet end of the tubular body, for delivery of clean air from the central passage of the tubular body; said tubular outlet member defining an annular contaminant chamber between the exterior of the outlet member and the interior wall of the central passage of the tubular body receiving separated contaminant particles; a wall extending between the tubular outlet member and the tubular body at the end of the annular chamber at that end; and a plurality of fins in the annular chamber which extend radially from at least one wall of the annular chamber at least partially across the annular chamber, to deflect the whirling air and particle flow and permit only axial flow, in a manner to inhibit the whirling movement of the particles retained in the chamber, and thus prevent abrasion of the wall of the tubular body there, substantially without interfering with the entry of particles into the chamber or with normal scavenge flow.

3,955,949
FLAME RETARDING FILTER DEVICE

John F. Rohrer, Moline, Ill., assignor to Smith Filter Corporation, Moline, Ill.

Filed Oct. 15, 1974, Ser. No. 514,378
Int. Cl.² B01D 45/08
U.S. Cl. 55—444 8 Claims

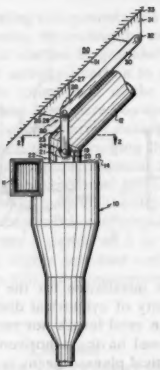


1. A flame retarding filter device for use in an air flow exhaust system which includes means for moving air through an exhaust path, and wherein the air may have combustible particles entrained therein, said flame retarding device comprising, in combination, a first set of baffle elements including a plurality of elongated baffle elements each of which has a generally planar longitudinal central portion and longitudinal edge portions angularly inclined relative to their associated planar central portion, means connecting the opposite ends of said first baffle elements such that said first baffle elements are disposed in parallel spaced relation with said planar central portions thereof lying substantially in a common plane and said longitudinal edge portions being angularly inclined from a common side of said common plane, a second set of baffle elements including a plurality of elongated baffle elements similar in configuration to said first baffle elements, means connecting the opposite ends of said second baffle elements such that said second baffle elements are disposed in parallel spaced relation and have their planar central portions lying in a common plane with their longitudinal edge portions inclined from a common side of said common plane, and means interconnecting said first and second sets of baffle elements such that said common planes are disposed in parallel spaced relation and said edge portions of each of said sets are inclined forwardly of said respective parallel planes, said first and second sets of baffle elements being offset relative to each other such that the planar central portions of the baffle elements of one set of baffle elements are disposed rearwardly of the spaces established between the baffle elements of the other set with the inclined longitudinal edge portions of said one set of baffle elements each being disposed rearwardly of at least a portion of an inclined longitudinal edge of a baffle element of said other set, when considered with the baffle elements disposed in generally vertical positions, said inclined longitudinal edges of said first and second sets of baffle elements being inclined such that flames impinging the forward set of said baffle elements in a direction generally normal to said common planes are turned back upon themselves in a direction substantially reverse to the direction of impingement, and any flames passing between the baffle elements of said forward set of baffle elements will impinge the rearward baffle elements and be turned back in a direction substantially reverse to the direction of impingement, said means connecting said opposite ends of said first baffle elements and said means connecting said opposite ends of said second baffle elements comprising upper and lower spaced support members disposed transverse to their associated baffle elements and said upper and lower support members forming pairs of upper and lower opposed support members which define drain openings facilitate drainage of grease or condensate formed on said baffle elements through the lower of said drain openings when said device is mounted in a manner such that said baffle elements lie in generally vertical planes with their longitudinal axes inclined or normal to horizontal.

3,955,950
CYCLONE VESSEL HANGER SYSTEM

James Frank Miller, Jr., Lebanon, Pa., assignor to Envirotech Corporation, Menlo Park, Calif.

Filed May 19, 1975, Ser. No. 578,953
Int. Cl.² B01D 45/12
U.S. Cl. 55—459 R 6 Claims



1. A hanger system for mounting an internal vessel in a depending position to a bulkhead wall of an external vessel comprising:

a. a first lug fixedly connected to a wall of the internal vessel, means forming an aperture in said first lug;

b. a second lug fixedly connected to and depending from a wall of the external vessel, means forming a longitudinal extending slot in said second lug;

c. a support member pinned through the aperture in said first lug and vertically extending to said second lug to support said internal vessel;

d. pin means within said slot connecting said support member to said second lug, said slot having horizontal and vertical components of direction permitting sliding movement of said support member with respect to the second lug;

e. an elongated stabilizing linkage member extending generally parallel to the direction of said slot, said linkage member having means forming an aperture adjacent each end thereof, said pin means extending through the aperture at one end of said linkage member permitting movement of said pin means within the slot; and

f. means including a second pin means for pinnedly connecting the end of said linkage member opposite the slot to a portion of said external vessel wall spaced from said second lug location.

3,955,951
REPAIRING CLOGGED ORIFICES IN FIBERIZING BUSHINGS

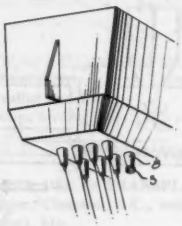
Walter William Harris, Toledo, and David Jon Pickard, Waterville, both of Ohio, assignors to Johns-Manville Corporation, Denver, Colo.

Filed June 2, 1975, Ser. No. 582,574
Int. Cl.² C03B 37/02
U.S. Cl. 65—1 13 Claims

1. In a process of making inorganic fibers by exuding molten inorganic material through orifices in a refractory bushing, the improvement comprising:

observing said bushing to detect a clogged orifice and when a clogged orifice is detected, inserting into said clogged orifice while said bushing is at an elevated temperature a

plug to seal off said clogged orifice, said plug comprising a first tapered portion and a second base portion, said first portion having a tip opposite said base portion whose diameter is smaller than the diameter of the clogged orifice and a portion adjacent said base portion whose



diameter Y is sufficiently greater than the diameter of said clogged orifice to produce a pressure fit without cracking or splitting the metal in the bushing surrounding said orifice, and the base portion having a diameter Z that is greater than Y to provide a seat for limiting the amount that the tip portion is inserted into the clogged orifice.

3,955,952

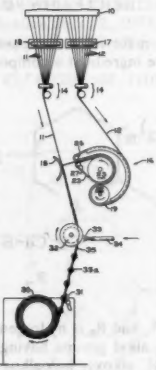
METHOD OF MAKING A SLUBBY STRAND

Warren W. Drummond, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 452,105, March 18, 1974. This application Jan. 31, 1975, Ser. No. 545,940

Int. Cl.² C03B *37/02*

U.S. Cl. 65—3 C **9 Claims**



1. The method of producing slubby glass fiber strand comprising drawing glass filaments from a molten glass source, applying an aqueous binder and/or size to the filaments, forming the filaments into two groups of glass filament strands, feeding one of said groups of glass strands at a first speed over a working surface and in parallel with each other, striking said working surface with the second of said groups of glass strands at a second speed, said strands being in parallel with each other but traveling in a direction transverse to the direction of travel of said first group of glass fiber strands, said second speed being in excess of said first speed, bending and crimping said second group of glass fiber strands on said working surface an entangling said second group of glass fiber strands with said first group of glass fiber strands upon said striking of said working surface thereby interlocking the strands of both groups and bulking the strands to produce a bulked strand, passing the bulked strand through a positive rotational gathering device to thereby form a consolidated strand of both of said groups and stripping back a portion of the surface of said consolidated strand to form intermittent slubs thereon and collecting the resulting slubby strand.

3,955,953

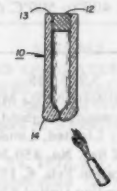
METHODS OF MAKING SELF FILTERING NOZZLES

Anthony J. Hauser, Stone Park, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed July 31, 1974, Ser. No. 493,449

Int. Cl.² C03B *23/20, 19/00, 21/00;* **B01D** *23/00*

U.S. Cl. 65—18 **5 Claims**



1. A method of making an integral nozzle and sintered particulate filter, within a tube having two ends, comprising the steps of:

packing sinterable particulate material into the tube;

sintering the particulate material to form a porous, unitary filter within the tube; and

thereafter forming a nozzle at one end of the tube having an orifice larger in diameter than the pore size of the sintered unitary filter.

3,955,954

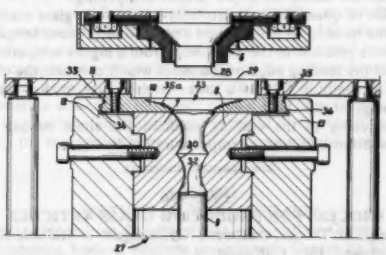
METHOD FOR THE PRODUCTION OF STEMMED GLASSWARE

Emil Ilk, Ahornweg 4, 8372 Zwiesel, Germany

Continuation-in-part of Ser. No. 415,640, Nov. 14, 1973, abandoned, which is a continuation-in-part of Ser. No. 224,595, Feb. 8, 1972, abandoned. This application Apr. 7, 1975, Ser. No. 565,573

Int. Cl.² C03B *23/22, 9/04*

U.S. Cl. 65—42 **5 Claims**



1. In a method for the production of stemmed glassware having a cup and a stem in which a stem is formed with a transverse cross section¹ dimension intermediate the ends of stem smaller than the cross sectional dimensions at the ends of the stem, the steps comprising:

rotating a platen carrying at least one stem mold divided longitudinally into position beneath a glass feeder,

dropping a drop of glass from said glass feeder through a distance in the range of about 20 mm to 40 mm from the feeder, the glass drop forming a skin and being centered within the divided mold,

rotating the platen to a pressing station to bring the mold with the drop therein beneath a pressing die, pressing the glass drop with the pressing die to form the stem in the divided mold,

opening the divided mold and discharging the stem, and attaching the head of the stem to a cup to form the stemmed glassware and wherein the temperature of the glass in said glass feeder has been adjusted to a substantially constant temperature maintained within a deviation of 2° to 3°C within the temperature range of 1100° to 1200°C, adjusting the weight of the glass drop to within plus or minus one gram of a predetermined weight, pressing the glass drop with a pressure of about 200 kgs, and heating the stem mold and maintaining its temperature in the range of about 400°to 500°C during molding of the stem.

3,955,955
GLASS TOUGHENING METHODS

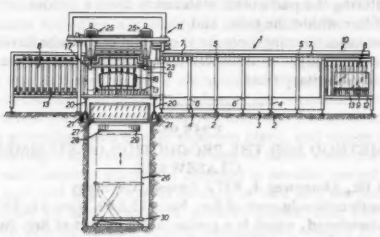
Richard Melling, Hollywood, England, assignor to Triplex Safety Glass Company Limited, London, England

Continuation-in-part of Ser. No. 450,361, March 12, 1974, abandoned. This application Feb. 4, 1975, Ser. No. 546,983

Claims priority, application United Kingdom, July 11, 1973, 34706/73

Int. Cl.² C03B 27/00

U.S. Cl. 65—104 **17 Claims**



1. In a glass toughening method in which a glass sheet is advanced through a heating zone into a chilling medium to quench the sheet, the improvement comprising:

prior to quenching, controllably heating the glass sheet in the heating zone to induce a substantially linear temperature gradient in the glass sheet from a higher temperature at the leading edge of the sheet which contacts the chilling medium first to a lower temperature at the trailing edge of the sheet; and

quenching in the chilling medium the sheet having the substantially linear temperature gradient.

3,955,956
PROCESS FOR PRODUCING GLASS ARTICLES

Emanuel M. Terner, Oakhurst, N.J., assignor to Midland Glass Company, Inc., Cliffwood, N.J.

Filed Aug. 6, 1975, Ser. No. 602,262

Int. Cl.² C03B 5/16

U.S. Cl. 65—134 **9 Claims**

1. A two-stage process for the formation of a glass product comprising:

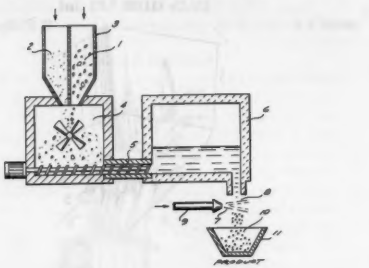
a. providing raw materials for a glass product;

b. mixing said glass raw materials;

c. melting said glass raw materials and refining to a glass product refined to a degree from 60 to 95%;

d. cooling said semi-refined glass product and forming said product into granules;

e. transporting said semi-refined glass granules to a glass finishing operation;



f. continuing the melting of said semi-refined glass product to provide a fully refined, molten glass; and

g. forming said fully refined, molten glass into a glass product.

3,955,957
PHOSPHORYL-ACYLAMINES FOR INHIBITING PLANT GROWTH

Elmar Sturm, Aesch, Switzerland, and Hans Jörg Cellarius, deceased, late of Riehen, Sweden (by Herta Cellarius Haigermoser, legal representative), assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

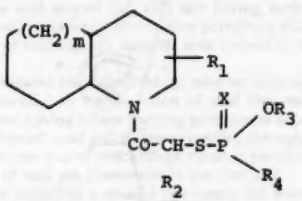
Division of Ser. No. 324,469, Jan. 17, 1973, Pat. No. 3,876,643. This application Jan. 30, 1975, Ser. No. 545,466

Claims priority, application Switzerland, Jan. 20, 1972, 910/72

Int. Cl.² A01N 9/22

U.S. Cl. 71—76 **21 Claims**

1. A composition for inhibiting plant growth which comprises (1) as active ingredient a compound of the formula



wherein each of R_1 and R_2 is hydrogen or methyl; R_3 is alkyl or haloalkyl, the alkyl groups having from 1 to 4 carbon atoms; R_4 is alkyl, alkoxy, haloalkoxy, alkylthio, the alkyl groups having from 1 to 4 carbon atoms, or amino; X is oxygen or sulphur; and *m* is zero or 1; and (2) a suitable carrier.

3,955,958
α-CYANO-α-DIALKYLPHOSPHONATO ACETANILDE HERBICIDES

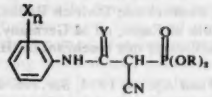
William D. Dixon, Kirkwood, Mo., and Maureen E. Becker, Glen Ellyn, Ill., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 495,958, Aug. 9, 1974, Pat. No. 3,907,937. This application Mar. 3, 1975, Ser. No. 554,869

Int. Cl.² A01N 9/36

U.S. Cl. 71—87 **7 Claims**

1. Herbicidal compositions comprising an adjuvant and an effective amount of a compound having the formula



wherein:

X is halogen, CN, or a C_{1-10} alkyl or alkoxy group;

n is an integer from 0–5;

Y is oxygen or sulfur and the

R's are alkyl groups having from 1–10 carbon atoms.

3,955,959

HERBICIDE FOR USE IN TRANSPLANTED RICE

Horace Dean Skipper, Clemson, S.C., assignor to Monsanto Company, St. Louis, Mo.

Filed July 12, 1974, Ser. No. 488,096

Int. Cl.² A01N 9/20

U.S. Cl. 71—118 **15 Claims**

1. Method for selectively inhibiting the growth of undesirable vegetation in the presence of transplanted rice which comprises applying to the locus thereof a herbicidally effective amount of the compound N-(butoxymethyl)-6'-tert-butyl-2-chloro-o-acetotoluidide.

3,955,960

METHOD FOR ROASTING FINELY DIVIDED SULPHIDE MATERIAL CONSISTING OF MAGNETIC PYRITES OR OF A FINELY DIVIDED MATERIAL DERIVED FROM A PYRITIC MATERIAL, IN WHICH THERMALLY SPLITTABLE SULPHUR IS EXPELLED BY PARTIAL ROASTING OR OTHER THERMAL TREATMENT

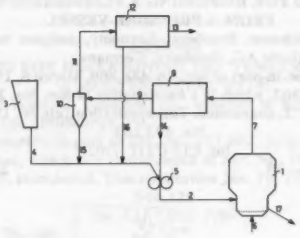
Karl Goran Gorling, Lidingo, Sweden, assignor to Boliden Aktiebolag, Stockholm, Sweden

Continuation of Ser. No. 331,606, Feb. 12, 1973, abandoned, which is a continuation of Ser. No. 135,134, April 19, 1971, abandoned. This application July 22, 1974, Ser. No. 490,749

Claims priority, application Sweden, Apr. 20, 1970, 5393/70

Int. Cl.² C22B 1/08, 1/10

U.S. Cl. 75—3 **8 Claims**



5. A process for forming an agglomerated, hardened, substantially sulfur-free product from fine grained, pyritic material comprising:

a. driving off thermally splittable sulfur from said pyritic material by partial roasting or other thermal treatment;

b. agglomerating the partially desulfurized material to a size distribution suited for fluidizing treatment;

c. controlling the moisture of the material to be sufficiently low to prevent the formed agglomerates decrepitating by steam pressure when subsequently being passed into a hot fluidized bed;

d. passing the agglomerated material into a fluidized bed furnace to be roasted and hardened at a temperature of between 700° and 1100°C. and

e. removing the hardened, substantially completely desulfurized iron oxide agglomerates from the bed in a hot condition.

3,955,961

CARBOXYLATE METALS PROCESS

Robert Kenneth Jordan, The Carlton House, Suite 1431, 550 Grant St., Pittsburgh, Pa. 15219

Filed Apr. 25, 1974, Ser. No. 463,981

Int. Cl.² B22F 9/00

U.S. Cl. 75—.5 R **12 Claims**

1. A process for the production of metals of atomic numbers 23 through 30 wherein a metal carboxylate selected from at least one of oxalates, formates, acetates, carbamates and malonates containing less than 12 percent water is reduced in an atmosphere containing hydrogen or carbon monoxide, or mixtures thereof, at a temperature in the range of from about 150°C to about 800°C.

3,955,962

METHOD OF AND APPARATUS FOR PRODUCING METAL FIBERS IN A MAGNETIC FIELD

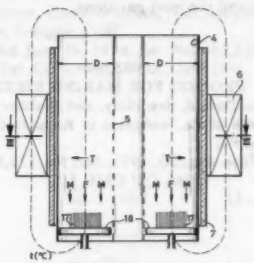
Walter Dawihl, Illingen, Saar, and Walter Eicke, Scheidt, both of Germany, assignors to Klockner-Werke AG, Duisburg, Germany

Filed Apr. 14, 1975, Ser. No. 568,026

Claims priority, application Germany, Apr. 13, 1974, 2418235

Int. Cl.² B22F 9/00

U.S. Cl. 75—.5 AA **26 Claims**



1. A method of producing metal fibers in a magnetic field, comprising the steps of generating magnetic flux lines which extend normal to a planar supporting surface located in an enclosed space; feeding carbonyls of metallic materials into said enclosed space for travel lengthwise of said flux lines and normal to said supporting surface; and heating said space to a decomposition temperature at which the carbonyls undergo thermal decomposition and liberate metal atoms which agglomerate under the influence of said flux lines on said supporting surface and form thereon metal fibers which project from the supporting surface in direction normal thereto.

3,955,963

METHOD OF REDUCING ORE

Nicolas Gerassimos Ponghis, Liege, and Arthur Gerard Poos, Embourg, both of Belgium, assignors to Centre de Recherches Metallurgigues-Centrum voor Research in de Metallurgie, Brussels, Belgium

Filed May 17, 1974, Ser. No. 471,171

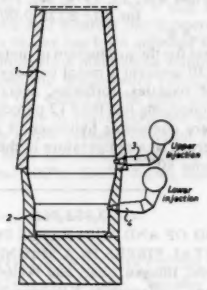
Claims priority, application Belgium, May 18, 1973, 799791

Int. Cl.² C22D 7/00

U.S. Cl. 75—40 **7 Claims**

1. A method of reducing ore in a furnace having a shaft comprising a stack in which a charge of ore and coke descends and a hearth below the stack in which molten metal and slag

collect, the method comprising the steps of: feeding ore and coke continually into the top of the stack; tapping metal and slag continually from the hearth; continuously injecting a reducing gas at 800° to 1200°C into the lower part of the stack; and continuously injecting into the top of the hearth, a



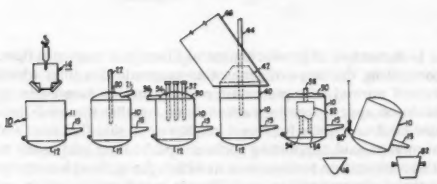
gas which is essentially chemically inert to the contents of the furnace, the inert gas being at 1700° to 2500°C, whereby the thermal requirements for melting of the slag and the metal and for chemical reactions in the furnace are satisfied by the reducing gas and the inert gas alone.

3,955,964

PROCESS FOR MAKING STEEL

Somerled MacDonald, Sewickley, and Walther H. Mathesius, Beaver, both of Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed Aug. 30, 1971, Ser. No. 175,956
Int. Cl.² C21C 5/52
U.S. Cl. 75—13 **7 Claims**



1. A process for making steel having both electric arc and basic-oxygen furnace capabilities comprising,

charging steel scrap into a vessel at a charging station,

thereafter advancing said vessel to an electric arc station,

melting at least a portion of said steel scrap in said vessel by means of electrically generated heat in electrodes positioned in said vessel at said electric arc station to form molten scrap steel,

charging molten iron and slag-making additives to said molten scrap steel in said vessel,

thereafter advancing said vessel to an oxygen blowing station, and

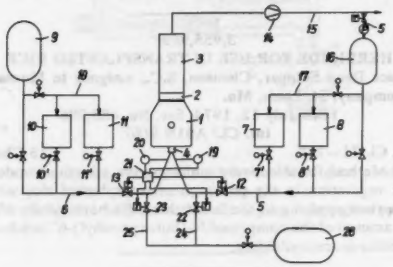
subjecting said charge of molten iron, slag-making additives, and scrap steel in said vessel at said oxygen blowing station to a high velocity stream of oxygen whereby said charge is refined into steel.

3,955,965

REFINING METALS

Udo Putzier, Neubeckum; Dietrich Radke, and Heinrich-Otto Rossner, both of Essen, all of Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Apr. 4, 1974, Ser. No. 458,032
Claims priority, application Germany, Apr. 4, 1973, 2316768
Int. Cl.² C21C 7/06
U.S. Cl. 75—52 **15 Claims**



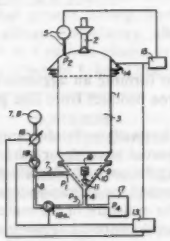
1. A process for refining a metal comprising introducing a stream of oxygen and particulate lime into a molten bath of the metal at a position below the surface thereof, introducing a stream of gas other than oxygen into and below the surface of the molten bath at about the same position in said bath as the position at which the stream of oxygen and particulate lime is introduced into said bath, the gas other than oxygen being a carrier gas which does not react with carbon, and introducing solid carbon or carbonaceous particles into the molten bath at a rate of at least 50 kg carbon content per metric ton of metal by introducing said particles into the carrier gas at a point outside the molten bath so that the carrier gas transmits said particles to the bath from a point outside the bath.

3,955,966

METHOD FOR DISPENSING A FLUIDIZABLE SOLID FROM A PRESSURE VESSEL

Walter Meichsner, Homberg, Germany, assignor to August Thyssen-Hutte AG, Duisburg, Germany

Continuation-in-part of Ser. No. 448,800, March 6, 1974, Pat. No. 3,807,602, which is a continuation of Ser. No. 270,397, July 10, 1972, abandoned. This application July 30, 1974, Ser. No. 493,202
Int. Cl.² C21C 7/02
U.S. Cl. 75—58 **22 Claims**



1. In the method of desulfurizing molten pig iron by forming a fluidized stream of a solid desulfurizing agent comprising a finely divided calcium carbide, which is maintained in a pres-

sure vessel, which vessel comprises a discharge connected with an immersion lance by a conveying pipe, by injecting a fluidizing gas upwardly into the desulfurizing agent, withdrawing fluidized desulfurizing agent from said pressure vessel, introducing a separate stream of a feeding gas into the conveying pipe and conveying said fluidized desulfurizing agent together with the fluidizing and feeding gases into the molten pig iron through said immersion lance, determining the amount of the solid desulfurizing agent, and the through flow quantity of gas flow, said through flow quantity of gas flow being the sum of the amount of fluidizing gas in the amount of feeding gas, and maintaining a predetermined constant gas/solid ratio, the improvement which comprises utilizing as the desulfurizing agent a finely divided calcium carbide mixed with a solid material which decomposes or evaporates at the temperature of said molten pig iron to evolve a gas and withdrawing the fluidized desulfurizing agent from said pressure vessel and feeding it into the molten pig iron at a rate of between 70 and 250 kilograms per minute and maintaining the gas/solid ratio at a value of 2 to 12 normal liters per kilogram.

3,955,967
TREATMENT OF STEEL

John MacNamara, Sault Ste. Marie, Canada, assignor to The Algoma Steel Corporation, Limited, Sault Ste. Marie, Canada

Continuation-in-part of Ser. No. 358,227, May 8, 1973, abandoned. This application May 20, 1974, Ser. No. 471,741
Claims priority, application Canada, May 2, 1973, 170265
Int. Cl.² C21C 7/06; C22B 9/10
U.S. Cl. 75—58 **11 Claims**

1. In the treatment of molten steel by the addition of at least one addition agent which has a high affinity for oxygen to said molten steel in a ladle during transportation of said molten steel from a steelmaking furnace for casting thereof, the improvement which comprises adding a deoxidizing agent to the molten steel, enclosing the addition agent in a metal container, and fixedly suspending said container in said ladle to submerge at least that portion of said container containing said addition agent so as to melt said container and release said addition agent beneath the surface of said molten steel in said ladle, said container having walls of sufficient thickness to provide a time delay in releasing said addition agent into said molten steel such that deoxidation of the steel by the deoxidizing agent is substantially completed before the addition agent is released.

3,955,968
METHOD FOR DETERMINING THE TEMPERATURE OF A MOLTEN METAL BATH

Reginald Wintrell, Gibsonia, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

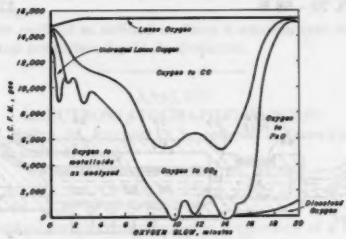
Continuation-in-part of Ser. No. 153,402, June 15, 1971, abandoned, which is a continuation of Ser. No. 792,643, Jan. 21, 1969, abandoned. This application Jan. 10, 1975, Ser. No. 540,125
Int. Cl.² C21C 7/00
U.S. Cl. 75—60 **10 Claims**

1. A method for determining the heat content of a molten metal bath in a top blown oxygen converter at a preselected time during the conversion process after substantially all of the metalloids in the molten metal bath and before the completion of the conversion process without utilizing direct temperature measurement of the molten metal bath comprising,

a. determining the heat content of the charge introduced into the converter without determining the carbon content of the charge,

b. determining the total heat of reaction of the molten metal bath from the beginning of the conversion process to a preselected time during the conversion process after oxidation of substantially all of the metalloids in the molten metal bath and prior to the completion of the conversion process,

c. determining the total heat loss of the molten metal bath from the beginning of the conversion process to said preselected time from factors associated with the conversion process, and

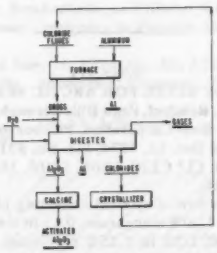


d. obtaining the heat content of the molten metal bath at said preselected time by summating the heat content of the charge, the total heat of reaction of the molten metal and the total heat loss from factors associated with the conversion process from the beginning of the conversion process to said preselected time during the conversion process.

3,955,969
PROCESS FOR THE PRODUCTION AND USE OF ACTIVATED ALUMINA

Arthur F. Johnson, Franklin Lakes, N.J., assignor to R.C.M. Corporation, Fontana, Calif.

Filed June 26, 1974, Ser. No. 483,129
Int. Cl.² C01F 7/02; C22B 21/00
U.S. Cl. 75—68 R **4 Claims**



1. The process for producing activated alumina from dross containing aluminum particles, alumina and impurities comprising:

charging said dross onto a layer of molten halide salts underlain by a layer of molten aluminum in a holding furnace, whereby a portion of the aluminum entrained within the dross enters the aluminum layer and the alumina and impurities are entrained in the halide flux layer;

separating said dross from said molten aluminum;

digesting said dross with hot water to at least partially dissolve halide salts and other soluble impurities and decompose insoluble impurities;

separating remaining aluminum particles and the purified alumina from said water as separate fractions;

drying said alumina to produce an activated alumina; and

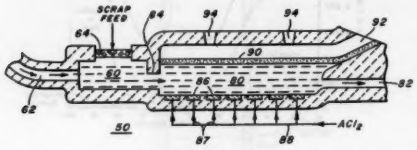
crystallizing and drying said halide salts from said water, and returning same to said holding furnace.

3,955,970

CONTINUOUS MELTING OF ALUMINUM SCRAP

Raymond J. Claxton, Fox Chapel, and Lee C. Blayden, New Kensington, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Apr. 8, 1974, Ser. No. 458,553
Int. Cl.² C22B 21/06
U.S. Cl. 75—68 R 22 Claims



1. A method of melting aluminum charge containing ¼ percent or more metallic oxide impurities from the group consisting of the oxides of Ti, Si and Ca, said oxides being reducible in molten aluminum to produce metallic impurities, the method comprising:

1. submerging said charge into molten aluminum at a temperature superheated with respect to the melting temperature of said charge thereby to melt said charge; and
2. treating said molten charge contained therein with a fluxing gas comprising a nonreactive gas, said treatment being initiated within 75 seconds after submergence of said charge and in advance of substantial chemical reduction of said oxides by said aluminum thereby to remove said oxides from reactivity with said aluminum and substantially decrease the reduction thereof by said aluminum.

3,955,971

ALLOY STEEL FOR ARCTIC SERVICE

Bartholomew G. Reisdorf, Penn Hills Borough, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Dec. 11, 1974, Ser. No. 531,653
Int. Cl.² C22C 38/06, 38/16, 38/22
U.S. Cl. 75—124 7 Claims

1. A weldable low-alloy steel consisting of 0.06 to 0.12% carbon, 0.20 to 1.00% manganese, 0.15 to 0.40% silicon, 0.75 to 1.50% nickel, 0.50 to 1.25% chromium, 0.15 to 0.40% molybdenum, 0.010 to 0.060% aluminum, up to 0.75% copper with the total copper plus chromium not exceeding 1.50%, and the balance iron and conventional impurities.

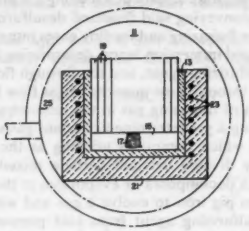
3,955,972

METHOD OF PRODUCING SHEETS AND ARTICLE TO PRACTICE SUCH METHOD

Gary E. Miller, Monroeville, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 566,603, July 20, 1966, Pat. No. 3,827,264. This application May 13, 1974, Ser. No. 468,971
Int. Cl.² C22C 33/00; C22B 9/10
U.S. Cl. 75—129 2 Claims

1. The method of producing an alloy of stainless steel having substantial quantities of boron therein, the said method comprising depositing the required quantity of boron powder in a thin can of mild steel, inserting said can in a crucible adapted to be evacuated, inserting the required mass of a virgin stainless steel boron in said crucible, evacuating said crucible, and



heating said crucible to about 1300°C to produce the said alloy.

3,955,973

PROCESS OF MAKING NODULAR IRON AND AFTER-TREATING ALLOY UTILIZED THEREIN

Michael Robinson, Bettendorf, Iowa, assignor to Deere & Company, Moline, Ill.

Filed May 20, 1974, Ser. No. 471,684
Int. Cl.² C22C 33/08
U.S. Cl. 75—130 R 23 Claims

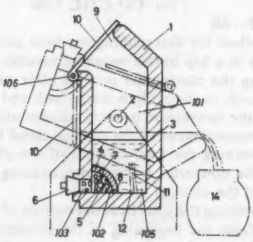
1. In a process for the production of cast nodular iron in which molten iron is first contacted with a graphite-spheroidizing agent in an amount sufficient to yield from about 0.03 to about 0.075 weight percent graphite-spheroidizing agent in the cast nodular iron, the improvement which comprises after-treating the contacted melt with an after-treating agent compatible with said contacted melt and containing from about 0.8 to about 1.8 percent by weight of magnesium whereby said first contacting can be performed with a reduced amount of graphite-spheroidizing agent sufficient to yield from about 0.02 to about 0.055 percent of the graphite-spheroidizing agent in the nodular iron without substantially detrimentally affecting the metallurgical properties of said nodular iron.

3,955,974

APPARATUS AND METHOD FOR TREATING A METAL MELT WITH A VAPORIZABLE SUBSTANCE

Anton Alt, Metzkausen, Germany, assignor to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Continuation of Ser. No. 253,957, May 17, 1972, abandoned, which is a continuation-in-part of Ser. No. 793,065, Jan. 22, 1969, Pat. No. 3,666,449. This application July 3, 1974, Ser. No. 485,702
Claims priority, application Germany, Aug. 11, 1973, 2340751; Switzerland, May 18, 1971, 7261/71
Int. Cl.² C22C 33/08
U.S. Cl. 75—130 R 6 Claims



1. A method for treating a metal melt with a vaporizable substance comprising the steps of:

providing a reaction vessel having a bottom and upstanding wall means extending generally perpendicularly from said bottom to define therewith a reaction space above said bottom within said vessel;

providing within said reaction space proximate said bottom an enclosed chamber at least including a wall extending with a directional component upwardly from said bottom;

providing a plurality of spaced passages extending through said chamber wall for communicating said reaction space with said chamber, said passages being provided at different vertical levels and spaced apart in a direction extending from said bottom along the direction of said upstanding wall means;

placing the substance to be vaporized within said chamber;

charging said reaction vessel with said metal melt by flowing said metal melt into said reaction space to cause said metal melt to rise from said bottom upwardly along said upstanding wall means as said metal melt is flowed into said reaction space;

maintaining said reaction vessel during said charging in a position to cause said metal melt to contact said chamber wall and progressively rise along said wall in contact therewith upwardly along the direction of said upstanding wall means thereby to cause said metal melt to progressively rise to the individual level of each of said spaced passages; and

permitting portions of said metal melt to flow into said reaction chamber by permitting said metal melt to flow individually through said spaced passages to contact and vaporize said vaporizable substance within said enclosed chamber as said charging of said reaction vessel proceeds.

3,955,975
MANIFOLD IMAGING MEMBER AND PROCESS EMPLOYING A METAL SOAP

Joseph M. Kropac, Williamson, N.Y., assignor to Xerox Corporation, Stamford, Conn.

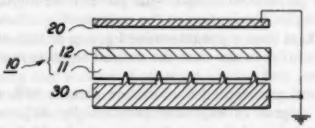
Filed Mar. 28, 1974, Ser. No. 455,760
Int. Cl.² G03G *13/22*
U.S. Cl. 96—1 M **20 Claims**

1. A manifold imaging member comprising a donor layer having coated thereon an electrically photosensitive imaging layer comprising an electrically photosensitive material, an electrically insulating binder material and from about 1 percent to about 60 percent by weight of a metal soap and residing upon said imaging layer a receiver layer, at least one of said donor and receiver layers being at least partially transparent to electromagnetic radiation to which said imaging layer is sensitive.

3,955,976
DEVELOPING METHOD IN ELECTROPHOTOGRAPHY

Satoru Honjo; Seiji Matsumoto, and Masamichi Sato, all of Osaka, Japan, assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 4, 1970, Ser. No. 95,139
Int. Cl.² G03G *13/10, 13/22*
U.S. Cl. 96—1 CY **5 Claims**



1. A method of development suitable for the reproduction of continuous tone images comprising providing an imaging member comprising a conductive substrate having a photoconductive layer superimposed thereover on which is formed a latent electrostatic image having charged image areas of varying charge density, placing a development electrode over said imaging member, providing a backing electrode comprising a conductive material having projections located on the surface thereof, applying said backing electrode to the underside of said imaging member causing said projections to penetrate said substrate so that sufficient electrical contact is made to prevent the development of bias voltages in the substrate thereby allowing for the proper reproduction of continuous tone images.

5. The method as defined in claim 4 wherein said development step comprises liquid development.

3,955,977
ELECTROSTATOGRAPHIC PROCESS

John M. Bailey, Jr., Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 30, 1970, Ser. No. 85,526
Int. Cl.² G03G *13/16, 13/22*
U.S. Cl. 96—1.4 **10 Claims**

1. Method for electrostatographic production of a temporary graphic display and conversion thereof to permanent hard copy comprising:

forming a latent electrostatic image on a photoconductive surface;

contacting said surface with a transparent continuous insulating web;

contacting the surface of the transparent web opposite that in contact with the latent image with electroscopic toner particles which electrostatically cling to the transparent web in conformity with said latent electrostatic image;

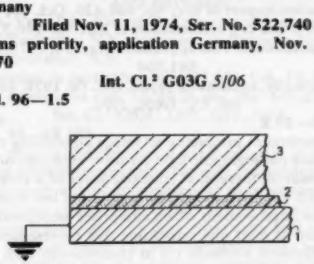
passing the developed image on the transparent web to a viewing station at which said developed image can be temporarily graphically displayed;

transferring said developed image to a transfer web being adapted to contact the surface of the transparent web containing the developed image, and fusing said developed image onto said transfer web thereby forming a permanent copy of said image.

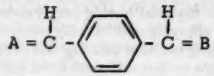
3,955,978
ELECTROPHOTOGRAPHIC RECORDING MATERIAL

Jürgen Rochlitz, Breckenheim, and Günter Schön, Wiesbaden, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Nov. 11, 1974, Ser. No. 522,740
Claims priority, application Germany, Nov. 12, 1973, 2356370
Int. Cl.² G03G *5/06*
U.S. Cl. 96—1.5 **13 Claims**

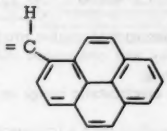


1. Electrophotographic recording material comprising an electrically conducting supporting material having thereon a photoconductive double layer of organic materials, said double layer being composed of a tightly packed and uniform, homogeneous, opaque, charge carrier-producing dyestuff layer and a transparent top layer of insulating material containing at least one charge-transporting compound, the transparent top layer comprising a binder and a charge-transporting aromatic compound with an extended π-electron system which is substituted by at least one substituted amino group, and the dyestuff layer comprising a condensation product of an aromatic aldehyde and a compound carrying an active methylene group, selected from the group consisting of a compound having a terephthylidene group of the general formula



wherein A and B, which are identical or different, represent a carbocyclic or N-heterocyclic five membered ring which may be condensed with a benzene radical and is substituted by one or more oxo-groups and also may be substituted by methyl or a nitro-substituted phenyl radical

and a cyclopentanone or cyclopentadione compound substituted by one or two pyrenylidene-(3)-groups of the following formula



which additionally may be condensed with a benzene radical.

3,955,979

FLASH EXPOSURE OF SUPERSENSITIZED SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Keisuke Shiba; Masanao Hinata, and Hirotetu Kato, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

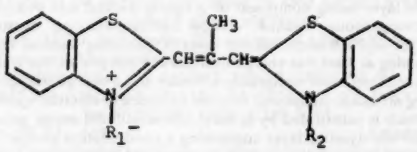
Continuation-in-part of Ser. No. 406,420, Oct. 15, 1973, abandoned, which is a continuation of Ser. No. 190,332, Oct. 18, 1971, abandoned. This application Mar. 24, 1975, Ser. No. 561,504

Claims priority, application Japan, Oct. 16, 1970, 45-90950

Int. Cl.² G03C *5/04*

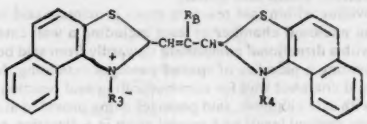
U.S. Cl. 96—27 E **7 Claims**

1. In a method of producing an image comprising exposing a silver halide photographic light sensitive element comprising a support bearing thereon at least one layer of a silver halide photographic emulsion to light for a period of less than 0.0001 seconds, the improvement which comprises incorporating into the emulsion at least one sensitizing dye represented by the following General Formula (I) in combination with at least one sensitizing dye represented by the following General Formula (II):



(I)

wherein R_1 and R_2 each represents an alkyl group, at least one of R_1 and R_2 being an alkyl group having a sulfo substituent,



(II)

wherein R_B represents a methyl group or an ethyl group, R_3 and R_4 have the same meaning as R_1 and R_2, at least one of R_3 and R_4 being an alkyl group having a sulfo substituent.

3,955,980

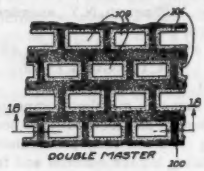
METHOD FOR MAKING A COLOR SELECTION MASK FOR A COLOR CATHODE RAY TUBE

Howard G. Lange, Prospect Heights, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Nov. 4, 1974, Ser. No. 520,836

Int. Cl.² G03C *5/00*

U.S. Cl. 96—36 **7 Claims**



1. For use in the manufacture of color selection masks for color television cathode ray tubes, a method of forming a pattern of electron-transmissive apertures of a predetermined size, shape and distribution in a color selection mask, said method comprising:

providing an etchable, electrically conductive blank having a substrate layer on which is disposed an aperture-defining layer;

applying a coating of photoresist material on said aperture-defining layer of said blank;

exposing the photoresist coating contemporaneously, in a first preselected illumination pattern with a preselected degree of exposure and with pattern elements corresponding in distribution to the pattern of apertures to be formed, at least a predetermined group of said elements being smaller in size than the desired ultimate mask aperture size, and

in a second preselected illumination pattern with a preselected degree of exposure substantially different from said preselected degree of exposure of said first preselected illumination pattern and with pattern elements substantially corresponding in distribution to said first preselected illumination pattern, but being substantially the size and shape of the desired ultimate mask aperture size and shape;

developing the exposed photoresist corresponding to the first preselected illumination pattern;

etching through the blank to form in said aperture-defining layer a preliminary pattern of apertures having, at least in a group of apertures corresponding to said group of pattern elements, a predetermined size which is smaller than the desired ultimate mask aperture size and to form in the substrate layer a pattern of apertures having the desired ultimate size and shape, each respectively undercutting the corresponding preliminary apertures in said aperture-defining layer;

developing the exposed areas of the photoresist coating corresponding to said second pattern of elements, thereby baring a portion of said aperture-defining layer substantially surrounding at least a portion of each of said preliminary etched apertures in said aperture-defining layer; and

etching through the newly portions of said aperture-defining layer to form a pattern of electron-transmissive apertures in the aperture-defining layer of the blank having the desired ultimate mask aperture size and shape.

3,955,981

METHOD OF FORMING ELECTRON-TRANSMISSIVE APERTURES IN A COLOR SELECTION MASK BY PHOTOETCHING WITH TWO RESIST LAYERS

Raymond M. Stachniak, Chicago, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Jan. 6, 1975, Ser. No. 538,846

Int. Cl.² G03C *5/00*

U.S. Cl. 96—36.1 **8 Claims**

1. For use in the manufacture of color selection masks for color television cathode ray tubes, a method of forming electron-transmissive apertures having a predetermined size, shape and distribution in a color selection mask, said method comprising:

providing an etchable, electrically conductive blank having a substrate layer on which is disposed an aperture-defining layer;

applying a first coating of negative-working photoresist material on said aperture-defining layer;

exposing the first photoresist coating through a preselected stencil forming in said photoresist coating a first preselected illumination pattern with unexposed pattern elements distributed according to the desired pattern of electron-transmissive apertures to be ultimately formed in said mask, said pattern elements having the desired ultimate mask aperture size, each and all of said unexposed pattern elements separated from all other unexposed pattern elements by exposed photoresist material;

developing the exposed first photoresist coating forming a first preselected array of aperture elements in said first photoresist coating corresponding to sid first illumination pattern;

applying a second coating of positive-working photoresist material on said first coating of exposed photoresist and on said first array of aperture elements in said first photoresist coating;

exposing said second photoresist coating in a second preselected illumination pattern with exposed pattern elements corresponding in distribution both to said first preselected array of aperture elements formed in said first photoresist coating and to the desired pattern of electron-transmissive apertures to be ultimately formed in said mask, a predetermined group of said second pattern elements being a smaller size than the desired ultimate mask aperture size;

developing the exposed pattern of elements in the second photoresist coating, forming a second preselected array of aperture elements in said second photoresist coating substantially superimposed over said first preselected array of aperture elements in said first photoresist coating and corresponding in distribution to both said first preselected array of aperture elements and to said desired pattern of electron-transmissive apertures to be ultimately formed in said electrically conductive blank, a predetermined group of said second array of aperture elements being a smaller size than the desired ultimate mask aperture size;

etching through the blank according to the second preselected array of aperture elements to form in said aperture-defining layer a pattern of preliminary apertures having, at least in a group of the apertures corresponding to said predetermined group of second pattern elements, a predetermined size which is smaller than a desired ultimate mask aperture size and to form in the substrate layer a pattern of ultimate sized and shaped apertures, each respectively undercutting the corresponding preliminary aperture in the aperture-defining layer;

removing said second photoresist coating, baring said first photoresist coating having said first preselected array of aperture elements formed therein; and

etching through said aperture-defining layer according to the first preselected array of aperture elements to form in said aperture-defining layer electron-transmissive apertures having the desired size and shape and each respective electron-transmissive aperture in the blank having reduced undercutting in the substrate layer.

3,955,982

PHOTOTHERMOGRAPHIC ELEMENT, COMPOSITION AND PROCESS

James A. VanAllan; Ronald H. Ericson, and Lorenzo F. Costa, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 443,891, Feb. 19, 1974. This application Feb. 12, 1975, Ser. No. 549,235

Int. Cl.² G03C *1/02, 5/24, 1/34*

U.S. Cl. 96—48 HD **30 Claims**

27. A process of developing a stable image in an imagewise-exposeed photothermographic element comprising a support having thereon a layer comprising (a) an oxidation-reduction image-forming combination comprising (i) an oxidizing agent comprising a silver salt of a long-chain fatty acid with (ii) an organic reducing agent, (b) photosensitive silver halide, (c) a polymeric binder, and (d) a halogen-containing organic stabilizer precursor comprising a stabilizing concentration of a compound represented by the formula:

wherein X is chloro, bromo or iodo; R^1, R^2 and R^3 are each hydrogen; alkyl containing 1 to 10 carbon atoms; hydroxyalkyl containing 1 to 10 carbon atoms; acyloxyalkyl containing 2 to 10 carbon atoms; nitro; nitroalkyl containing 1 to 10 carbon atoms; aryl containing 6 to 12 carbon atoms; acyl of the formula R^4—CO— wherein R^4 is alkyl containing 1 to 5 carbon atoms, or aryl containing 6 to 12 carbon atoms; amido of the formula:

wherein R^5 and R^6 are each hydrogen, alkyl containing 1 to 5 carbon atoms, phenyl or naphthyl; sulfonyl represented by the formula $R^7—SO_2—$ wherein R^7 is alkyl containing 1 to 5 carbon atoms or aryl containing 6 to 12 carbon atoms; and wherein at least one of R^1, R^2 and R^3 is a stabilizer precursor activating substituent; comprising heating said element to a temperature from about 80° to about 250° C.

3,955,983

PROCESS FOR FORMING A COLOR IMAGE ON AN EXPOSED PHOTOSENSITIVE MATERIAL

Yosuke Nakajima; Yoshihiko Yamada; Haruhiko Iwano, and Katsuhiko Ohtani, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation-in-part of Ser. No. 240,484, April 3, 1972, abandoned. This application Dec. 12, 1974, Ser. No. 532,104
Claims priority, application Japan, Apr. 2, 1971, 46-20190
Int. Cl.² G03C *7/00*
U.S. Cl. 96—55 **10 Claims**

1. In a process for forming a color image of an image on a photographic X-ray element having coated on opposite surfaces of a support monochromatically photosensitive silver halide emulsion layers including the steps of subjecting the X-ray image-wise exposed element to color development in the presence of a color coupler with a developer solution containing a p-phenylene diamine developing agent whereby said color coupler couples with the oxidation product of said developing agent to form a color image in said element and fixing said color image in said element, the improvement comprising omitting desilverization from said color development and said developer solution additionally containing 1-phenyl-3-pyrazolidone.

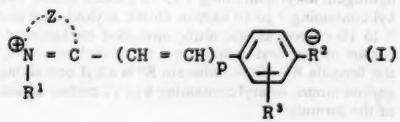
3,955,984

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MEMBER WITH BACKING LAYER

Teruo Kobayashi; Tohru Sueyoshi; Masatoshi Sugiyama, and Hiroshi Sawaguchi, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Apr. 18, 1975, Ser. No. 569,434
Claims priority, application Japan, Apr. 19, 1974, 49-43296
Int. Cl.² G03C *1/84, 1/78;* C09B *23/14*
U.S. Cl. 96—84 R **10 Claims**

1. A silver halide photographic light-sensitive member comprising a support having on one side of said support at least one silver halide photographic emulsion layer and on the other side of said support at least one layer containing at least one dye represented by the following formula (I):



(I)

wherein Z is a group of atoms required for forming an indolenine nucleus or a benzindolenine nucleus; R^1 is a lower alkyl group or a lower alkenyl group; R^2 is an $—OXSO_3^-$ group or an

group wherein X is an alkylene group or an alkenylene group, and Y is a hydrogen atom, an alkyl group, an alkenyl group, an aryl group, an acyl group, or an $—OXSO_3^-$ group; R^3 is a hydrogen atom, a halogen atom, an alkyl group, an alkenyl group, a hydroxy group, an alkoxy group, an alkylthio group, a carboxy group, an alkoxycarbonyl group, an alkoxycarbonylamino group, or an acylamino group; and *p* is 1 or 2.

3,955,985

STABLE WATER REPELLENT COMPOSITIONS

Erhard Bosch; Ewald Pirson, and Michael Roth, all of Burghausen, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed July 11, 1974, Ser. No. 487,692
Int. Cl.² C09K *3/18*
U.S. Cl. 106—2 **7 Claims**

1. A stable aqueous solution for rendering masonry surfaces water repellent consisting essentially of an alkali metal organosiliconate in which the organic group is selected from the group consisting of alkyl radicals having from 2 to 3 carbon atoms and a phenyl radical, an organic aqueous soluble complexing agent capable of forming a stable aqueous soluble complex with alkaline earth metals, said complexing agent is selected from the class consisting of alkali metal salts of aminopolycarboxylic acids and polyamines and an aqueous miscible organic solvent selected from the class consisting of aliphatic monovalent alcohols having from 1 to 4 carbon atoms and ketones having from 3 to 5 carbon atoms and water.

3,955,986

HARD SURFACE CLEANING AND POLISHING COMPOSITION

Richard K. Miller, Ramsey, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 377,680, July 9, 1973, abandoned. This application Oct. 23, 1974, Ser. No. 517,264
Int. Cl.² C09G *1/14*
U.S. Cl. 106—11 **9 Claims**

1. In a hard surface cleaning and polishing composition consisting essentially of mineral oil, a nonionic surfactant and a paraffinic solvent, the improvement consisting essentially of the addition of 1 to 15 parts of a monoalkyl ether of ethyl glycol and 1 to 10 parts of a monoalkyl ether of diethylene glycol, said monoalkyls having from 3 to 5 carbon atoms.

3,955,987

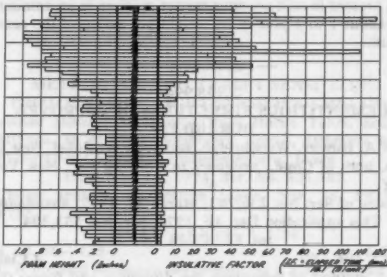
INTUMESCENT COMPOSITIONS AND SUBSTRATES COATED THEREWITH

John L. Schaar; James A. Ellard, and John Mann Butler, all of Dayton, Ohio, assignors to Monsanto Research Corporation, St. Louis, Mo.

Filed Apr. 19, 1974, Ser. No. 462,273
Int. Cl.² C09D *5/18;* C09K *3/28*
U.S. Cl. 106—15 FP **10 Claims**

1. A substrate coated with a water-removable intumescent heat-and-fire-proofing composition comprising monoammonium phosphate, diammonium phosphate or mixtures thereof as the ammonium phosphate in an amount in the range of about 50 to 60 percent by weight, cyanoguanidine, urea or mixtures thereof as the amine compound in an amount in the range of about 18 to 25 percent by weight; sucrose or sucrose

+ a hexanehexol as the polyhydric compound in an amount in the range of about 10 to 15 percent by weight; and, titanium



dioxide as the heat reflecting substance in an amount in the range of about 5 to 20 percent by weight.

3,955,988

BINDER COMPOSITION FOR INORGANIC COMPOUNDS

Erhard Bosch; Michael Roth, and Konrad Gogolok, all of Burghausen, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed Apr. 12, 1974, Ser. No. 460,635

Claims priority, application Germany, Apr. 12, 1973, 2318494

Int. Cl.² B28B 7/34

U.S. Cl. 106—38.35 **7 Claims**

1. A binder composition substantially free of water which is mixed with inorganic substances prior to hydrolysis comprising (1) an alkyl silicate having alkoxy groups of from 1 to 4 carbon atoms and those silicon valences which are free of alkoxy groups are satisfied with siloxane oxygen atoms (2) an organic solvent having a boiling point up to about 250°C. and (3) a catalytic amount of a hydrolysis catalyst selected from the class consisting of carboxylic acid metallic salts and carboxylic acid organometallic salts in which the metals are selected from those ranging from lead to manganese in the electromotive series, said alkyl silicate is present in an amount of from about 2 to about 97.99 percent based on the total weight of the composition containing components (1), (2) and (3).

3,955,989

CRYSTALLIZED GLASS ARTICLE HAVING A SURFACE PATTERN

Shigeharu Nakamura, Otsu, Japan, assignor to Nippon Electric Glass Company, Limited, Tokyo, Japan

Continuation of Ser. No. 325,317, Jan. 22, 1973, abandoned. This application Oct. 10, 1974, Ser. No. 513,736

Claims priority, application Japan, Jan. 22, 1972, 47-8039

Int. Cl.² C03C 3/22

U.S. Cl. 106—39.6 **9 Claims**

1. A crystallized glass article consisting of an integral body of individual small masses of crystallized glass, the individual small masses being fusion-bonded along interfaces by heat-treating an accumulation of the individual small masses, a plurality of adjacent ones of the small masses forming a surface layer of the article, each of the fusion-bonded small masses having needle-like β-wollastonite crystals precipitated by the heat treatment and extending from the surface of the small mass into the interior thereof in a direction generally perpendicular to the surface of the small mass, the crystals being generally parallel to the surface of the glass article in the region of the interfaces between the adjacent fusion-bonded individual small masses and being generally perpendicular to the surface of the glass article in the region of the exposed surface portion of each small mass at the article surface between the interfaces whereby a surface pattern defined by the small masses forming the surface layer is imparted to the glass article and in which surface pattern parallel crystals appear as relatively opaque portions transmitting substantially no light and perpendicular crystals appear as semi-transparent or transparent portions having relatively high light transmission.

3,955,990

VITROCERAMICS

Jean Paul Tochon, Saint-Cloud, France, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France

Continuation-in-part of Ser. No. 246,847, April 24, 1972, abandoned, which is a division of Ser. No. 37,037, May 13, 1970, abandoned. This application Feb. 7, 1975, Ser. No. 547,981

Claims priority, application France, May 14, 1969, 69.15707

Int. Cl.² C03C 3/22

U.S. Cl. 106—39.6 **7 Claims**

1. A vitroceramic body consisting essentially of the following ingredients in the approximate weight percent:

$Al_2O_3 + SiO_2$	57–63% of which Al_2O_3 is 4–10%,
$CaO + MgO$	20–26% of which CaO is 13–20% and MgO is 3.5–8%,
$Na_2O + K_2O$	9–12% and $Na_2O > K_2O$,
F	5–9%,
BaO	<10%,
ZnO	<5%,
Impurities	<5%,

the BaO and ZnO when present replacing equimolar parts of MgO, the said composition being vitreous with a dispersed devitrified phase and being substantially devoid of sulfur.

3,955,991

ABSORPTIVE GLASS

Robert W. Young, Woodstock, Conn., and Robert E. Graf, Southbridge, Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Mar. 2, 1967, Ser. No. 621,728

Int. Cl.² C03C 9/00

U.S. Cl. 106—47 Q **4 Claims**

1. An absorptive glass material having a calculated oxide composition comprising

	Percent by Weight
Lanthanum Oxide (La_2O_3)	15 to 33
Boron Oxide (B_2O_3)	9 to 22
Silicon Dioxide (SiO_2)	up to 8
Barium Oxide (BaO)	4 to 30
Cadmium Oxide (CdO)	up to 12
Zinc Oxide (ZnO)	up to 4
Zirconium Dioxide (ZrO_2)	up to 9
Tantalum Oxide (Ta_2O_5)	7 to 12
Tungsten Trioxide (WO_3)	up to 6
Thorium Dioxide (ThO_2)	up to 2
Aluminum Oxide (Al_2O_3)	up to 0.6
Columbium Oxide (Cb_2O_5)	up to 9

said glass material including colorants selected from the group consisting of

	Percent by Weight
Manganese Dioxide (MnO_2)	15 to 25
Chromium Oxide (Cr_2O_3)	up to 0.5
Ferric Oxide (Fe_2O_3)	up to 5
Cobalt Oxide (Co_3O_4)	up to 4
Cupric Oxide (CuO)	up to 5
Nickelic Oxide (Ni_2O_3)	up to 3

said glass having an optical density of at least 0.25 at least for light of wavelengths between 0.4 and 0.6 microns.

3,955,992

CEMENTITIOUS WALL COMPOSITION AND METHOD

Albert Lee Roberts, 4309 Paseo De Las Tortugas, Torrance, Calif. 90505

Filed Dec. 17, 1973, Ser. No. 424,939

Int. Cl.[2] C04B *7/02, 9/35*

U.S. Cl. 106—90 **31 Claims**

1. A cementitious composition suitable for spray application in the formation of a dense wall structure, said composition comprising:

about 50 to about 65 percent by weight of substantially spherical quartz sand having an average particle size of about 87 mesh to about 20 mesh;

a finely ground Portland cement;

a plastic-in-water emulsion having a solids content of about 20 to about 50 percent by weight of the emulsion;

the plastic in said emulsion being present in the form of minute spherical particles having a particle size of about 0.05 to about 50 microns and said plastic being capable of forming a tacky film at ambient temperatures and bonding to said substantially spherical quartz sand;

a high molecular weight, long chain, water soluble polymeric flow control material in an amount sufficient to provide the composition with laminar flow properties during spray application;

said composition having a low water-to-cement ratio in the range of about 0.3 to about 0.5;

said composition having a Brookfield viscosity of about 4,000 to about 9,000 centipoises as measured at 20 rpm with a Brookfield Synchroelectric Viscometer, Model LVF, using a number 3 spindle, and

said composition having thixotropic viscosity characteristics,

whereby said composition may be sprayed onto a generally vertical support surface in the formation of a dense wall structure having a low void content and substantially free from surface cracking or crazing with said composition being sufficiently viscous so that it will adhere to the generally vertical support surface without running and sagging.

3,955,993

METHOD AND COMPOSITION FOR STABILIZING INCOMPETENT OIL-CONTAINING FORMATIONS

Beverly A. Curtice, Portsmouth, Va., and Bobby G. Harnsberger, Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 429,428, Dec. 28, 1973, Pat. No. 3,862,663. This application Sept. 26, 1974, Ser. No. 509,386

Int. Cl.[2] C04B *7/35*

U.S. Cl. 106—90 **6 Claims**

1. A treating composition suspended in an aqueous medium fraction for use in forming a permeable cement barrier against an unconsolidated sand-containing oil producing formation which comprises cement, from about 4 to 6 parts by weight of sand particles having a mesh size of from about 20 to 40 mesh, from 0.3 to 0.4 part of a blended refined lubricating oil fraction containing from about 1 to 7% by weight of sulfurized sperm oil and from about 1 to 7% by weight of lead naphthenate therein, from about 0.009 to about 0.02 part by weight of an oil wetting agent to oil wet the sand and cement particles, and from about 0.01 to about 0.04 part by weight of finely ground silica per part of cement, said treating composition being present in said aqueous carrier medium in an amount of from about 1 to 5 pounds by weight per gallon of the carrier medium.

3,955,994

CEMENTITIOUS STRUCTURES OF IMPROVED DURABILITY

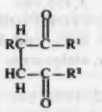
Byron A. Hunter, Woodbridge, and John W. Zukel, New Haven, both of Conn., assignors to Uniroyal Inc., New York, N.Y.

Division of Ser. No. 236,763, March 21, 1972, abandoned. This application Dec. 16, 1974, Ser. No. 533,394

Int. Cl.[2] C04B *7/02*

U.S. Cl. 106—90 **4 Claims**

1. A method of improving the durability and freeze-thaw stability of cementitious structures, comprising applying an effective amount of a chemical compound of the general formula:



Where R may be an alkyl, haloalkyl or alkenyl group having from 8 to 40 carbon atoms,

R^1 and R^2 may be the same or different, and may be NR^3R^4 or $-OR^5$, wherein R^3, R^4 and R^5 may be the same or different, and may be hydrogen or an alkyl group having from 1 to 3 carbon atoms — provided that at least one of the R^1 and R^2 groups is a hydroxy moiety;

and their ammonia, amine or metal salts, or R^1 and R^2 combined represent a single divalent oxygen atom; onto the cementitious structure.

3,955,995

CALCINATION OF PULVEROUS MATERIAL

Jorn Touborg, Copenhagen Valby, Denmark, assignor to F. L. Smidth & Co., Cresskill, N.J.

Filed Dec. 10, 1973, Ser. No. 423,436

Claims priority, application United Kingdom, Dec. 11, 1972, 57071/72

Int. Cl.[2] C04B *7/44*

U.S. Cl. 106—100 **39 Claims**

1. A method of heat treating a pulverous raw material at least a portion of which is in the form of lime to produce at least a partial calcination comprising:

a. preheating said raw material;

b. introducing said preheated raw material into a substantially confined space;

c. accumulating a quantity of the preheated raw material in said confined space;

d. mixing at least a portion of said preheated raw material intimately with a fuel capable of carrying out at least a partial calcination thereof, said fuel being at least one of a combustible gas and a fuel which is capable of providing a combustible gas upon contacting the preheated raw material, thereby providing a suspension of said raw material in said combustible gas;

e. providing a flow of oxygen-containing gas in contacting relation with a least a portion of said suspension of combustible gas and raw material in such a manner so as to burn the combustible gas and the individual particles of raw material to at least partially calcine the raw material substantially isothermically;

f. entraining said treated raw material particles in the total stream of exit gases resulting from the combustion and calcination process; and

g. separating the treated raw material from said stream of gases.

3,955,996

METHOD FOR SPECTRALLY SENSITIZING PHOTOGRAPHIC LIGHT-SENSITIVE EMULSION

Masanao Hinata; Masanaga Ohki; Haruo Takei, and Yuji Mihara, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Nov. 15, 1974, Ser. No. 524,185

Claims priority, application Japan, Nov. 15, 1973, 48-128755

Int. Cl.² G03C 1/24, 1/16

U.S. Cl. 96—129 5 Claims

1. A method for spectrally sensitizing a photographic light-sensitive silver halide emulsion, which comprises dissolving a photographic spectrally sensitizing dye having an amidinium ion auxochrome in an acid-containing organic solvent solution consisting essentially of a water-miscible organic solvent and not more than 10% by weight of an acid having a pKa not exceeding about 5 and being substantially free of water, and adding said solution to a light-sensitive silver halide emulsion.

3,955,997

SEMI-SOLID EMULSION COATING COMPOSITION

Masahiko Sagane, Hiratsuka, and Koichi Murai, Kyoto, both of Japan, assignors to Kansai Paint Company, Amagasaki, Japan

Filed Aug. 3, 1973, Ser. No. 385,422

Claims priority, application Japan, Aug. 9, 1972, 47-79178

Int. Cl.² C08L 23/04, 91/00

U.S. Cl. 106—131 4 Claims

1. A semi-solid emulsion coating composition which is shapable and fluidizable under shear, comprising:

A. an aqueous emulsion comprising a film-forming polymeric component selected from the group consisting of modified drying oil, polyvinyl esters, comprising polyvinyl acetate, vinyl acetate-ethylene copolymer, polyvinyl chloride, acrylic resin, polystyrene, styrene-butadiene copolymer, polyacrylonitrile, polyamide, vinyl chloride-vinylidene chloride copolymer and fluorinated copolymer resin;

B. a water soluble organic solvent selected from the group consisting of methyl alcohol, ethyl alcohol, n-propyl alcohol, isopropyl alcohol, tert-butyl alcohol, ethyleneglycol, propyleneglycol, dioxane, tetrahydrofuran, ethyleneglycol, monomethyl ether, ethyleneglycol monoethyl ether, ethyleneglycol mono-n-butyl ether, diethyleneglycol monobutyl ether, diacetone alcohol N,N-dimethyl formamide, N,N-dimethyl acetamide, N-methyl-1-pyrrolidone, dimethyl acetal, dimethyl sulfoxide, ethylene carbonate, acetone, methyl formate;

C. a thixotropy imparting material selected from a group consisting of hydrogenated caster oil and condensation products of pentahydric to heptahydric sugar alcohols with aromatic aldehydes; and

D. a hydrophilic polymer selected from the group consisting of hydrophilic cellulose derivative such as methyl cellulose, ethyl cellulose, hydroxyethyl cellulose, hydroxypropyl cellulose and sodium carboxymethyl cellulose, polyvinyl alcohol, poly-N-vinyl pyrrolidone,, polyacrylate and its alkali or ammonium salts, polyethyleneglycol, polypropyleneglycol, starch, gelatine, casein, acasiagum (gum arabic), tragacanth gum and sodium alginate;

said coating composition comprising from about 35 to about 65% by weight water soluble organic solvent, from about 1 to about 5% by weight thixotropic imparting material, from 0.5 to 5% by weight hydrophilic polymer, and from about 20 to about 60 % by weight polymeric material; said coating composition characterized as having a defined hardness ranging from 500 to 6,000 g/cm².

3,955,998

AQUEOUS GELS FOR PLUGGING FRACTURES IN SUBTERRANEAN FORMATION AND PRODUCTION OF SAID AQUEOUS GELS

Richard L. Clampitt, and James E. Hessert, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 372,242, June 21, 1973, Pat. No. 3,845,822, which is a continuation-in-part of Ser. No. 224,956, Feb. 9, 1972, abandoned. This application July 18, 1974, Ser. No. 489,749

Int. Cl.² C08L 1/26

U.S. Cl. 106—193 R 23 Claims

1. An aqueous gel, suitable for plugging fractures in subterranean formations, comprising water to which there has been added:

a water-thickening amount of a water-soluble cellulose ether;

a water-soluble compound of a polyvalent metal, wherein the valence state of the metal therein is capable of being reduced to a lower polyvalent valence state, in an amount which is sufficient to cause gelation of said water containing said cellulose ether when the valence of at least a portion of said metal is reduced to said lower valence state;

a water-soluble reducing agent in an amount which is effective to reduce at least a portion of said metal to said lower valence state and cause said gelation with the formation of said gel, said reducing agent being selected from the group consisting of sodium sulfite, sodium hydrosulfite, potassium hydrosulfite, sodium metabisulfite, potassium sulfite, sodium bisulfite, potassium metabisulfite, sodium sulfide, hydrogen sulfide, sodium, potassium thiosulfate, thioacetamide, hydroquinone, p-hydrazinobenzoic acid, hydrazine phosphite, hydrazine dichloride, and mixtures thereof; and

a finely divided solid capable of causing, and in an amount thereof sufficient to cause, an increase in the gel strength of said gel.

13. A method for producing an aqueous gel having increased gel strength, and which is suitable for plugging fractures in subterranean formations, which method comprises:

thickening water by incorporating therein a thickening amount of a water-soluble cellulose ether;

incorporating in said water a water-soluble compound of a polyvalent metal, wherein the valence state of the metal therein is capable of being reduced to a lower polyvalent valence state, in an amount which is sufficient to cause gelation of said water containing said cellulose ether when the valence of at least a portion of said metal is reduced to said lower valence state;

incorporating in said water a water-soluble reducing agent in an amount which is effective to reduced at least a portion of said metal to said lower valence state and cause said gelation with the formation of said gel, said reducing agent being selected from the group consisting of sodium sulfite, sodium hydrosulfite, potassium hydrosulfite, sodium metabisulfite, potassium sulfite, sodium bisulfite, potassium metabisulfite, sodium sulfide, hydrogen sulfide, sodium thiosulfate, potassium thiosulfate, thioacetamide, hydroquinone, p-hydrazinobenzoic acid, hydrazine phosphite, hydrazine dichloride, and mixtures thereof; and

incorporating in said water a finely divided solid capable of causing, and in an amount thereof sufficient to cause, an increase in the gel strength of said gel.

3,955,999

CREAM WAX AND THE METHOD OF PREPARATION THEREOF

Paul Snellgrove, First Presbyterian Church, P.O. Box 507, Lake Providence, La. 02901

Filed July 22, 1974, Ser. No. 490,853

Int. Cl.² C08J *3/02*; C08L *91/00*, *91/06*; C09D *3/387*

U.S. Cl. 106—245 **2 Claims**

1. A method for the preparation of cream waxes, comprising the steps of:

melting and mixing beeswax, paraffin wax and turpentine in the percentages by weight to the total weight of the cream wax of substantially 8%, substantially 2.4% and 16%, respectively, at a temperature of approximately 128° F.;

adding substantially 8% heated linseed oil by weight to the total weight of cream wax to said mixture at an approximate temperature of 120° F.;

adding substantially 43.2% naphtha by weight to the total weight of cream wax to said mixture at a reduced temperature;

mixing substantially 20% water and substantially 2.4% soap by weight to the total weight of cream wax at a temperature of approximately 130° F. and adding the water and soap mixture to the previously formed mixture at ambient temperature; and

agitating and heating the mixture to approximately 110° F.

3,956,000

FLUOROCARBON WAXES AND PROCESS FOR PRODUCING THEM

Jurgen Kuhls, Burghausen; Herbert Fitz, Burgkirchen, and Peter Haasemann, Kastl, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation-in-part of Ser. No. 379,647, July 16, 1973, abandoned. This application Jan. 22, 1975, Ser. No. 543,166

Claims priority, application Germany, July 21, 1972, 2235885

Int. Cl.² C08F *2/38*, *14/26*; C08L *91/06*

U.S. Cl. 106—270 **6 Claims**

1. Process for the manufacture of fluorocarbon waxes, having a mean molecular weight, determined by elementary analysis of terminal chlorine, bromine, or iodine atoms in relation to the fluorine, in the range of from 10,000 to 200,000, and an apparent melt viscosity of from $0.7 \cdot 10^2$ to $1 \cdot 10^5$ poises at 380°C under 200 kg/cm², by telomerization of tetrafluoroethylene or mixtures of tetrafluoroethylene with 0.1 to 40 mole % of at least one comonomer having the formula $CH_2 = CH_2$, $CF_2 = CFX$, where X is H, CF_3, Cl, Br, or I, or $CF_2 = CY_2$, where Y is H, Cl, Br or I, which comprises telomerizing without a coating agent at a temperature of from 0° to 40°C and a pressure of from 0 to 25 atmospheres gauge in the presence of from 0.1 to 15 % by weight, calculated on the monomer(s) used, of at least one telogen of the formula CH_nZ_{4-n}, CH_2I, $C_mF_{2m+1}I$, $CF_2I\text{-}CF_2I$, or $CFI_2\text{-}CF_3$, where n is zero or an integer of from 1 to 3, Z is Cl or Br and m is an integer of from 1 to 3, in aqueous weakly alkaline phase in the presence of initiators and emulsifiers known for the dispersion polymerization of tetrafluoroethylene, while applying a specific stirring energy in the range of from $2.4 \cdot 10^{-5}$ to $4.5 \cdot 10^{-5}$ kg . m/sec/cc, to obtain a stable fluorocarbon wax dispersion, coagulating the said dispersion and drying the fluorocarbon wax obtained.

3,956,001

RETARDING SKIN FORMATION ON ASPHALT IN HOT STORAGE

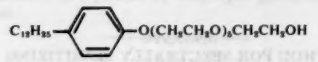
Armin C. Pitchford, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 10, 1974, Ser. No. 513,826

Int. Cl.² C08L *95/00*

U.S. Cl. 106—273 R **12 Claims**

1. A method for inhibiting surface hardening of asphalt under storage conditions of temperature in the range in excess of 170°C, said method consisting essentially of the incorporation into the asphalt mixture of a stabilizing amount of dodecylphenoxypoly(ethyleneoxy)ethanol having the formula



in the range of about 50 ppm to about 10,000 ppm.

3,956,002

ANIONIC BITUMINOUS EMULSIONS

Howard H. Moorer, Charleston, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed Mar. 18, 1974, Ser. No. 452,018

Int. Cl.² C08L *95/00*

U.S. Cl. 106—277 **7 Claims**

1. An oil-in-water anionic bituminous emulsion which comprises,

a. from about 30% to about 75% by weight of the emulsion of bitumen as the disperse phase,

b. from about 0.1% to about 10.0% by weight of an anionic emulsifier consisting of an oxygenated alkali lignin produced by bubbling oxygen or air through a solution of alkali lignin at a pH between 10 and 13 and at a temperature of 50°C to 100°C and an ethylene oxide adduct of an aklyl phenol in a weight ratio of 10:1 to 1:10 of lignin to an alkyl phenol adduct, and from 0% to about 10% by weight sodium borate, and

c. water in an amount to make up 100% by weight as the continuous phase.

3,956,003

SPHERICAL AGGREGATES

Pierre-Claude Aitcin, Sherbrooke, and Claude Poulin, North Hatley, both of Canada, assignors to Universite de Sherbrooke, Canada

Filed June 19, 1974, Ser. No. 481,118

Int. Cl.² C04B *33/00*

U.S. Cl. 106—288 B **3 Claims**

1. As a new product suitable for use as lightweight aggregate in the manufacture of lightweight concrete, the lightweight aggregate being in the shape of a hollow sphere, the outside surface of the wall being substantially rough and the inner surface of which is substantially vitrified, the wall being made of fired mineral or ceramic powder, the outer diameter of said sphere being ⅛ to 1½ inches, the thickness of the wall being from 0.045 to 0.30 of an inch, the sphere being also characterized by a saturated surface dried specific gravity of from 1.4 to 1.65.

3,956,004

MANUFACTURE OF GRANULAR LEAD COMPOUNDS

Yujiro Sugahara, Tokyo; Yoshibumi Noshi, Tsuruoka; Hiroyuki Naito, Tsuruoka, and Katsuya Toki, Tsuruoka, all of Japan, assignors to Mizusawa Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Feb. 27, 1973, Ser. No. 336,230

Claims priority, application Japan, Mar. 6, 1972, 47-22354; Nov. 22, 1972, 47-116541

Int. Cl.² C04B *31/02*

U.S. Cl. 106—297 **9 Claims**

1. A solid lead-bearing additive for use in the ceramic industry which consists essentially of brickettes obtained by calcining the granular mixture of a lead oxide and silicon dioxide, wherein the weight ratio of the lead oxide calculated as PbO and silicon dioxide calculated as SiO_2 is within the following range:

PbO : SiO_2 = 93 : 7 ~ 30 : 70,

said brickettes having the particle size of from 0.1 to 10 mm, said brickettes having an apparent density expressed by the following formula:

$$D = Kd\,(\,Xd_x + Yd_s\,)$$

wherein D is an apparent density in g/cc of the brickettes, d_x represents a true density of the lead oxide component, X represents the weight ratio of the lead oxide component contained in the brickettes, d_s represents a true density of silicon dioxide, Y represents the weight ratio of silicon dioxide contained in the brickettes, and Kd is a number from 0.2 to 0.85

and having a nitric acid reactivity (RN) of 10 to 96.5%, where RN is defined by the formula

$$RN = \frac{X_1}{X_o} \times 100$$

wherein X_O is the weight in grams of the lead oxide contained in 5 g of the brickettes, and X_1 is the weight in grams of the lead oxide which is dissolved when 5 g of the brickettes are agitated for 20 minutes in 50 ml. of 1.34 N nitric acid.

3,956,005

COATED PIGMENT COMPOSITION HAVING IMPROVED ABRASION RESISTANCE AND PROCESS FOR PREPARATION THEREOF

Yujiro Sugahara, Tokyo; Kaichiro Miyazawa, Tsuruoka; Okitsu Hidetika, Tsuruoka, and Mamoru Saito, Tsuruoka, all of Japan, assignors to Mizusawa Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 22, 1974, Ser. No. 472,196

Claims priority, application Japan, May 23, 1973, 48-56742

Int. Cl.² C09C 1/20

U.S. Cl. 106—298 **15 Claims**

1. A coated pigment composition having improved resistance, especially to abrasion, which consists essentially of particles composed mainly of an inorganic color pigment and a continuous solid glass coating layer covering the surfaces of said pigment particles, said continuous solid glass coating layer being formed of a continuous phase composed mainly of an alkali polysilicate having the following mole composition

$$M_2O : SiO_2 = \text{from } 1 : 5 \text{ to } 1 : 2$$

wherein M stands for an alkali metal component, in which the solid glass coating layer is present in an amount, as calculated as SiO_2, of from 3 to 40% by weight based on said pigment particles and the value of the specific surface area ratio, expressed by the following formula

$$R_s = S_c/S_p$$

wherein S_p stands for the specific surface area (m^2/g) of uncoated pigment particles, S_c stands for the specific surface area (m^2/g) of coated pigment particles, and R_s stands for the specific surface area ratio,

is within a range of from 1.00 to 1.07.

3,956,006

COMPOSITE PIGMENT OF ISOMETRIC RUTILE AND ACICULAR MODIFIED POTASSIUM HEXATITANATE

Gerhard Winter, Krefeld; Werner Fuhr, Krefeld-Uerdingen, and Jakob Rademachers, Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 31, 1974, Ser. No. 438,330

Claims priority, application Germany, Feb. 8, 1973, 2306280

Int. Cl.² C09C 1/36

U.S. Cl. 106—292 **12 Claims**

1. A white composite pigment, containing isometric rutile pigment particles, acicular modified potassium hexatitanate in about 20 to 70% by weight of the pigment and about 0.1 to 10% of a polyvalent metal ion and about 0.1 to 5% of fluorine ion by weight of TiO_2 in the composite pigment.

3,956,007

ANTIMONY-FREE YELLOW PIGMENTS AND THEIR PREPARATION

Zoltan M. Modly, Shaker Heights, Ohio, assignor to Kewanee Oil Company, Bryn Mawr, Pa.

Filed Jan. 27, 1975, Ser. No. 544,441

Int. Cl.² C09C 1/36

U.S. Cl. 106—300 **10 Claims**

1. A yellow pigment composition having a dominant wavelength in the range of about 571 to 578 NM and an excitation purity in the range of about 55 to 68% by the CIE determination, said pigment consisting essentially of a solid solution of (A) 55 to 95 weight percent titanium dioxide, at least 99.5 percent of which has the rutile crystal structure and any remaining has the anatase crystal structure, said titanium dioxide containing in its structure (B) 1 to 35 weight percent nickel, (C) 1 to 25 weight percent tungsten, (D) 0.1 to 20 weight percent zinc, (E) 0.1 to 15 weight percent cerium, (F) 0.1 to 20 weight percent magnesium and (G) 0.01 to 5 weight percent lithium, said weight percentages being based on the total weight of solid solution.

3,956,008

LIQUID COLORANT DISPERSIONS FOR PLASTICS

Siegfried Knepper, Radevormwald, Germany; William M. Arnheim, III, Westfield, and Lawrence John Grenner, Fair Lawn, both of N.J., assignors to Kark Finke OHG, Wuppertal-Barmen, Germany and Inmont Corporation, New York, N.Y., part interest to each

Filed Feb. 27, 1974, Ser. No. 446,457

Int. Cl.² C09C 3/08

U.S. Cl. 106—308 B **10 Claims**

1. A liquid colorant dispersion for coloring plastics comprising a colorant and a vehicle, the vehicle comprising:

1. a physically active, chemically inert inorganic fine particle solid having a particle size between about 2 and about 50 microns, wherein 99% of the particles are over 0.4 microns in diameter and 99% are under 120 microns, and wherein the surface area as indicated by oil absorption is between 2 and 35 cc/100 grams, said fine particle solid being selected from the group consisting of silica and the carbonates, sulfates and silicates of the alkaline earth metals,
2. a surfactant system having an HLB greater than about 1.5 and comprising at least one sorbitan ester selected from the group consisting of sorbitan-monolaurate, -monooleate, -trioleate, -sesquioleate, -palmitate,-monostearate, -tristearate, and mixtures thereof, and at least one polyoxyethylene-substituted sorbitan ester wherein the polyoxyethylene chain length ranges from 4 to 40;

and wherein:

a. the dispersion is stable for at least two months at temperatures between about -40°F and 140°F,

b. the vehicle contains component (1) from about 5 to about 60 percent, and component (2) from about 95 to about 40 percent,

c. the surfactant system has a boiling point above about 200°C at 5 mm. Hg. and

d. the dispersion has a viscosity between about 300–35,000 centipoise, a plastic viscosity between about 800 and 15,000 centipoise and a yield of about 0.0–25 units.

3,956,009

METHOD FOR DRYING FRUCTOSE SOLUTIONS

Joseph Theodore Lundquist, Jr., Ellicott City; Preston Leonard Veltman, Severna Park, and Edward Theodore Woodruff, Woodbine, all of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed May 14, 1975, Ser. No. 577,218

Int. Cl.² B01D *1/18;* C13K *11/00*

U.S. Cl. 127—62 9 Claims

1. A process for preparing dried solid fructose particulate free-flowing products from fructose solutions comprising:

a. Drying dispersed fructose solution in a current of heated gas and in the presence of 1 to 10 parts by weight of separately introduced recycled product solids per part by weight of solids in the solution to be dried; and

b. Supplying the hot drying gas at an outlet temperature of 60° to 120° C while maintaining average product residence time in the drying zone at about 30 seconds or less.

3,956,010

DRY PICKLING METHOD

Robert H. Kachik, Washington Township, Westmoreland County, and Arthur J. Pignocco, Franklin Township, Westmoreland County, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 367,922, June 7, 1973, abandoned. This application Oct. 1, 1974, Ser. No. 510,975

Int. Cl.² C23G *5/00;* B08B *5/00*

U.S. Cl. 134—2 7 Claims

1. Method of pickling hot steel having an external layer of metal oxide scale comprising contacting the hot steel with chlorine gas in the substantial absence of a reducing agent, said chlorine gas being impinged against the steel surface at a rate of at least 12cc. per square inch of steel surface, to loosen scale thereon and then removing the loosened scale by mechanical action.

3,956,011

METHOD FOR CLEANING DISPOSABLE SUCTION CATHETERS

John S. Carleton, 1015 Ellis Ave., Lufkin, Tex. 75901

Continuation-in-part of Ser. No. 460,111, April 11, 1974, abandoned. This application May 2, 1974, Ser. No. 466,216

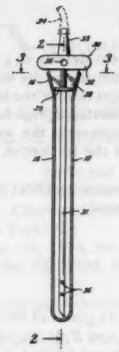
Int. Cl.² B08B *3/04, 9/00;* A61M *25/02*

U.S. Cl. 134—21 2 Claims

1. In a method for cleaning suction catheters, the combination of steps comprising:

securing the suction catheter depending from a holder into an opening in a vessel, the opening mating with the said holder, after using said catheter in connection with treating a patient;

flowing a cleaning solution into said vessel to the level of soil on said catheter suspended therein;



and, suctioning substantially all of said cleaning solution from said vessel through said catheter.

3,956,012

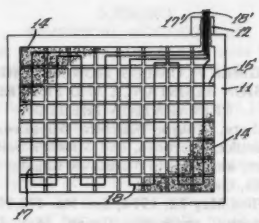
STORAGE BATTERY PLATES OF PLASTIC AND LEAD

William R. Scholle, Long Beach, Calif., assignor to Scholle Corporation, Compton, Calif.

Filed June 10, 1974, Ser. No. 478,149

Int. Cl.² H01M *35/08*

U.S. Cl. 136—58 18 Claims



1. A storage battery plate consisting essentially of a rigid polymer plastic frame having a window therein, a grid in said window in the form of a plurality of intersecting polymer plastic members connected to said frame, and free of electrical conductivity; at least one strand of lead disposed in said window and supported by said grid, said at least one strand free of intersection with another said strand; a plate terminal connected to said strand; and battery paste filling said grid and covering said strand.

3,956,013

FUEL CELL

Noriomi Miyoshi; Yasuo Watabe, and Michihiko Tsuruoka, all of Kawasaki, Japan, assignors to Fuji Electric Company Ltd., Kawasaki, Japan

Division of Ser. No. 456,993, April 1, 1974, abandoned. This application June 11, 1975, Ser. No. 585,905

Claims priority, application Japan, Mar. 30, 1973, 48-36529

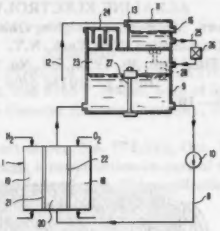
Int. Cl.² H01M *8/04*

U.S. Cl. 136—86 R 1 Claim

1. In a fuel cell comprising:

1. a generator cell having a fuel gas chamber, an oxidizing gas chamber, and an electrolyzing solution chamber;

2. a fuel gas circulating circuit for supplying fuel gas to the fuel gas chamber of said generator cell;
3. an oxidizing gas circulating circuit for supplying oxidizing gas to the oxidizing gas chamber of said generator cell;
4. an electrolyte circulating circuit for supplying an electrolytic solution to the electrolyzing solution chamber of said generator cell,
5. a gas cooler located in said fuel gas circulating circuit beneath said generator cell;
6. a formed water tank located beneath said gas cooler and in fluid communication therewith, whereby moisture formed in said generating cell, carried by said fuel gas into said gas cooler, and condensed therein will drip by force of gravity into said formed water tank;
7. an electrolyzing solution tank located in said electrolyte circulating circuit above said generator cell; and
8. a clean water tank located above said electrolyzing solution tank and in fluid communication therewith, whereby clean water can be supplied by force of gravity from time to time to said electrolyzing solution tank from said clean water tank in order to control the concentration of the electrolytic solution thereih,



whereby gas leaked into the electrolyzing solution chamber of said generator cell is carried by the electrolytic solution flowing through said electrolyte circulating circuit upwards into said electrolyzing solution tank, where it is easily separated from the electrolytic solution, and electrolytic solution leaked into the fuel gas chamber of said generator cell is carried by the fuel gas flowing through said fuel gas circulating circuit downwards into said gas cooler, where it is separated from the fuel gas and dripped into said formed water tank, the improvement comprising:

a. means for sensing the level of electrolytic solution in said electrolyzing solution tank and
b. means for opening the path of fluid communication between said electrolyzing solution tank and said clean water tank when the level of electrolytic solution in said electrolyzing solution tank is below a predetermined level and for closing the path of fluid communication between said electrolyzing solution tank and said clean water tank when the level of electrolytic solution in said electrolyzing solution tank is above the predetermined level.

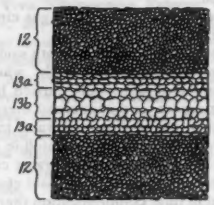
3,956,014

PRECISELY-STRUCTURED ELECTROCHEMICAL CELL ELECTRODE AND METHOD OF MAKING SAME

Douglas A. Landsman, West Hartford, and Edward I. Thiery, Winsted, both of Conn., assignors to United Technologies Corporation, East Hartford, Conn.

Filed Dec. 18, 1974, Ser. No. 533,917
Int. Cl.² H01M 4/00, 4/04
U.S. Cl. 136—86 D **11 Claims**

1. An electrochemical cell electrode comprising a first face adapted to be exposed to an electroylte and a second face adapted to be exposed to a gaseous fuel cell reactant, a plurality of porous hydrophobic regions extending between said first and second faces and a plurality of porous hydrophilic catalyst-containing regions extending between said first and second surfaces, said hydrophobic and hydrophilic regions being disposed alternately with each other with the interfaces between said regions being contiguous and clearly defined across the thickness of the electrode from said first surface to said second surface.

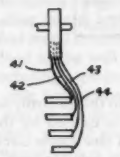


3,956,015

LIGHTWEIGHT NICKEL HYDROGEN CELL

Howard H. Rogers, Woodlands Hills, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed June 6, 1975, Ser. No. 584,566
Int. Cl.² H01M 8/02, 2/00
U.S. Cl. 136—86 A **2 Claims**



1. In a metal-gas cell having a plurality of cell plates of one potential and an electrical terminal to be connected with the said cell plates, the said cell plates being positioned at a plurality of respective separate distances from the said terminal, the improvement comprising:

a. a plurality of electrical conductive leads in one-to-one relationship connecting the said cell plates to the said terminal, each of the said leads having cross sectional areas varying directly to the length of the said lead, whereby the electrical resistances of all the said leads are of equal value; and
b. means for electrically insulating each of the said plurality of leads.

3,956,016

FUEL CELL

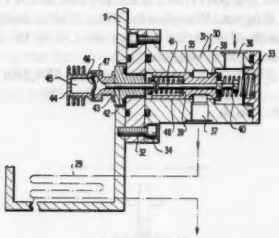
Noriomi Miyoshi; Yasuo Watabe, and Hiroshi Hoshikawa, all of Kawasaki, Japan, assignors to Fuji Electric Company Ltd., Kawasaki, Japan

Division of Ser. No. 456,993, April 1, 1974, abandoned.
This application June 11, 1975, Ser. No. 585,904
Claims priority, application Japan, Mar. 30, 1973, 48-36533
Int. Cl.² H01M 8/04
U.S. Cl. 136—86 R **2 Claims**

1. In a fuel cell comprising:

1. a generator cell having a fuel gas chamber, an oxidizing gas chamber, and an electrolyzing solution chamber;
2. a fuel gas circulating circuit for supplying fuel gas to the fuel gas chamber of said generator cell;

3. an oxidizing gas circulating circuit for supplying oxidizing gas to the oxidizing gas chamber of said generator cell;
4. an electrolyte circulating circuit for supplying an electrolytic solution to the electrolyzing solution chamber of said generator cell;
5. a gas cooler located in said fuel gas circulating circuit beneath said generator cell;
6. a formed water tank located beneath said gas cooler and in fluid communication therewith, whereby moisture formed in said generating cell, carried by said fuel gas into said gas cooler, and condensed therein will drip by force of gravity into said formed water tank;
7. an electrolyzing solution tank located in said electrolyte circulating circuit above said generator cell; and
8. a clean water tank located above said electrolyzing solution tank and in fluid communication therewith, whereby clean water can be supplied by force of gravity from time to time to said electrolyzing solution tank from said clean water tank in order to control the concentrating of the electrolytic solution therein,



whereby gas leaked into the electrolyzing solution chamber of said generator cell is carried by the electrolytic solution flowing through said electrolyte circulating circuit upwards into said electrolyzing solution tank, where it is easily separated from the electrolytic solution, and electrolytic solution leaked into the fuel gas chamber of said generator cell is carried by the fuel gas flowing through said fuel gas circulating circuit downwards into said gas cooler, where it is separated from the fuel gas and dripped into said formed water tank, the improvement comprising:

1. a water cooling pipe passing through said electrolyzing solution tank;
2. means for sensing the temperature of the electrolytic solution in said electrolyzing solution tank; and
3. means for passing cooling water through said water cooling pipe when said means for sensing the temperature of the electrolytic solution in said electrolyzing solution tank senses that the temperature of the electrolytic solution is above a predetermined temperature.

3,956,017

OPTOELECTRIC TRANSDUCER

Junichiro Shigemasa, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 9, 1975, Ser. No. 566,186
Claims priority, application Japan, Apr. 9, 1974, 49-40580
Int. Cl.² H01L *31/04, 35/00*
U.S. Cl. 136—89 **12 Claims**

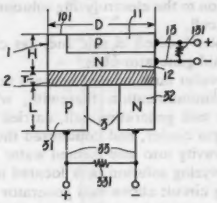
1. An optoelectric transducer comprising:

a solar cell having two major surfaces, one of which is exposed to radiation;

a heat conduction metal layer attached to the other major surface of the solar cell;

a thermoelectric converter attached to the heat conduction metal layer; and

lead wires separately connected to the solar cell and the thermoelectric converter in order to provide output of the



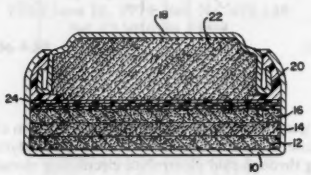
electric energy generated by the solar cell and the thermoelectric converter.

3,956,018

PRIMARY ELECTRIC CURRENT-PRODUCING DRY CELL USING A $(CF_X)_N$ CATHODE AND AN AQUEOUS ALKALINE ELECTROLYTE

Akiya Kozawa, Middleburg Heights, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 30, 1974, Ser. No. 537,596
Int. Cl.² H01M *6/00*
U.S. Cl. 136—102 **31 Claims**



1. A primary electric current-producing dry cell comprising a zinc anode, a cathode comprising a polycarbonfluoride compound of the formula $(CF_x)_n$, electrically conductive material and an electrolyte absorbing material, and an aqueous alkaline electrolyte.

15. A primary electric current-producing dry cell comprising a zinc anode, a cathode comprising a polycarbonfluoride compound of the formula $(CF_x)_n$ and electrically conductive material, an aqueous alkaline electrolyte and a wetting agent.

3,956,019

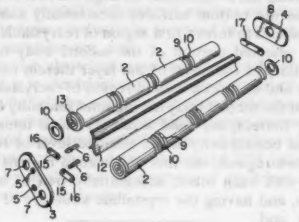
BATTERY CASSETTE POWER SOURCE DEVICE

Kenichi Mabuchi, Tokyo, and Yoshihisa Tsuchimochi, Ichikawa, both of Japan, assignors to Mabuchi Motor Co. Ltd., Tokyo, Japan

Filed Oct. 23, 1974, Ser. No. 517,181
Claims priority, application Japan, Oct. 29, 1973, 48-121416; Oct. 29, 1973, 48-125182[U]; Oct. 29, 1973, 48-125185[U]
Int. Cl.² H01M *2/02*
U.S. Cl. 136—132 **7 Claims**

1. A battery power source device comprising a battery cassette, two side-by-side rows of cells connected to each other in series, a recess in said device for accommodating said battery cassette, an insulating separator extending longitudinally within the cassette to engage and separate said two rows of cells, two terminal sockets mounted in longitudinal spaces between said two side-by-side rows of cells; two connecting plates positioned on a first one of the end faces of said cassette and a single connecting plate positioned on a second one of the end faces of said cassette, each of said two connecting plates electrically coupling one of said batteries at said first

end to one of said sockets, said single connecting plate electrically coupling said batteries at said second end to each other, a plug electrically connected to said sockets, said plug including a lead-in cord that is adapted to be connected to an appa-



ratus that is to be powered by said batteries; and an envelope containing all of said foregoing elements but not said plug, said envelope being made of a thermo-contractive synthetic resinuous film.

3,956,020

ULTRAFINE POROUS POLYMER ARTICLES

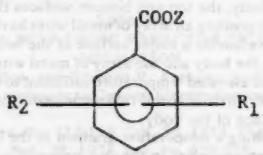
Joseph L. Weininger, and Fred F. Holub, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 772,392, Oct. 31, 1968, abandoned, which is a continuation-in-part of Ser. No. 717,893, April 1, 1968, abandoned. This application Mar. 24, 1971, Ser. No. 127,848

Int. Cl.² H01M 2/14

U.S. Cl. 136—146 **12 Claims**

1. The method of making an ultrafine, porous polymer article having a porosity of 40% and greater provided by ultrafine and substantially uniformly distributed continuous and interconnecting pores of diameter from 40 to 120 Angstroms which consists of heating a solid polymer body selected from the group consisting of crystalline thermoplastic polymers exhibiting at least 70 percent crystallinity and blends of such crystalline thermoplastic polymers and thermoplastic polymers exhibiting up to 65 percent crystallinity wherein the polymer exhibiting up to 65 percent crystallinity is present in an amount up to 50 weight percent of the crystalline polymer at a temperature of at least in its melting temperature range, forming a composite body by incorporating uniformly therein a salt having the formula



where Z is metal selected from the group consisting of alkali metals, and mixtures of such alkali metals and alkaline earth metals, R_1 is a radical selected from the group consisting of hydrogen, alkyl C_{1-4}, aryl, and halogen, and R_2 is a radical selected from the group consisting of hydrogen, alkyl C_{1-4}, aryl, and halogen; the weight of the salt being greater than 70% and no more than 85% by weight of the total weight of the composite body, shaping the composite body at a temperature in the range of the initial heating temperature of the polymer, cooling the shaped composite body to room temperature, forming a solid composite body, and dissolving the salt from the solid composite body leaving the polymer as an ultrafine porous article.

3,956,021

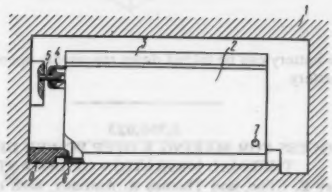
STORAGE BATTERY

Mikhail Stepanovich Tsygankov, ulitsa Ordzhonikidze, 14, kv. 24; Nina Alexandrovna Bitjutskaya, ulitsa Stepana Razina, 36, kv. 18; Vera Nikonorovna Fateeva, ulitsa Ordzhonikidze, 14, kv. 28; Valery Nikolaevich Kosholkin, Novo-Astrakhanskoe shosse, 43, kv. 47; Boris Dmitrievich Karev, ulitsa Millerovskaya, 73a, kv. 4; Nikolai Alexeevich Kudinov, ulitsa Chapaeva, 128; Mars Mikhailovich Kholkin, ulitsa Chapaeva, 29, kv. 28; Nikolai Nikiforovich Moiseev, prospekt Kirova, 15, kv. 4, and Oleg Georgievich Malandin, ulitsa Sovetskaya, 23, kv. 23, all of Saratov, U.S.S.R.

Filed May 9, 1974, Ser. No. 468,549

Int. Cl.² H01M 2/04

U.S. Cl. 136—166 **3 Claims**



1. A storage battery adapted to be mounted in a compartment and adapted for being connected to a plug member attached to a wall of said compartment, said battery comprising: a metal container including a plastic lid including projections and further including lateral and longitudinal walls; a plug socket means on said metal container and connectible to the plug member attached to the wall of said compartment; said metal container including a projection on a lateral wall thereof, carrying said plug socket means, and at least two studs arranged on the said longitudinal walls and adapted to retain said storage battery in said compartment; insulating strips on the said longitudinal walls of said metal container and serving, together with said plastic lid, as electric insulation between said metal container and said compartment and as guides when said storage battery is mounted in said compartment and said plug member is engaged with said plug socket means; said plug socket means including contact sockets in the form of hollow cylinders divided along the generatrices thereof into a plurality of sectors by slots provided in said plug socket means.

3,956,022

STORAGE BATTERY WITH CARRYING DEVICE

Albert L. Fox, University Heights, Ohio, assignor to ESB Incorporated, Philadelphia, Pa.

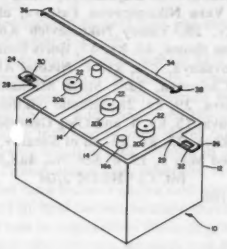
Continuation of Ser. No. 410,511, Oct. 29, 1973, abandoned. This application Mar. 17, 1975, Ser. No. 558,710

Int. Cl.² H01M 2/00

U.S. Cl. 136—181 **9 Claims**

1. A storage battery having a plurality of cells in a container and a cover therefor with each cell comprising positive plates, negative plates, separators between the positive and negative plates, and electrolyte, said container or cover or both the container and cover being polypropylene, said battery having 2 polypropylene lifting ears located on opposite sides of the battery, each lifting ear extending above the top of the battery with the portion above the battery having a hole therein adapted to removeably receive the end of a carrying strap, said lifting ears being located diagonally from each other so that when the carrying strap is inserted in the lifting ears the center of gravity of the battery in an upright position falls approximately under the center of the carrying strap, and both of said lifting ears being flexed at the time they are made so as to orient the molecules to provide a tough pliant hinge

section which is located just above the top of the battery whereby the portion of the lifting ears extending above the top



of the battery can be folded down repeatedly upon the top of the battery.

3,956,023

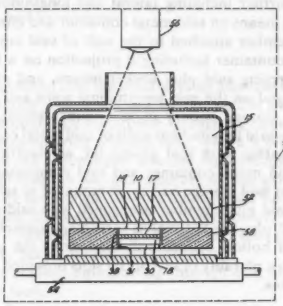
PROCESS FOR MAKING A DEEP POWER DIODE BY THERMAL MIGRATION OF DOPANT

Harvey E. Cline, and Thomas R. Anthony, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 411,001, Oct. 30, 1973, abandoned. This application Oct. 30, 1974, Ser. No. 519,249

Int. Cl.² H01L 7/36

U.S. Cl. 148—1.5 **45 Claims**



1. A process for making a semiconductor device comprising:

a. selecting a first body of single crystal semiconductor material having top and bottom surfaces which are opposed major surfaces thereof and at least the top surface has a preferred crystal orientation corresponding to the natural solid-liquid facet plane thereof;

b. vapor depositing a first layer of metal of a preferred thickness on the top surface of the first body and in intimate contact therewith;

c. placing the first body in an abutting contact relationship with a second body of single crystal semiconductor material having top and bottom surfaces which are opposed major surfaces thereof wherein the layer of metal on the top surface on he first body is in an abutting contact relaionship with the top surface of the second body;

d. heating the two bodies and the layer of metal to an elevated temperature sufficient to form a molten region of the metal of the layer and the semiconductor material of the two bodies in contact therewith, the molten region having a preferred thickness not greater than about 20 microns in thickness;

e. establishing a thermal gradient substantially along a preferred crystallographic axis of the first body which is normal to the natural solid-liquid facet plane of the semiconductor metal liquid surface wherein the bottom surface of the first body is at the highest temperature;

f. migrating the molten zone through the first body from the top to the bottom surfaces substantially along the preferred axis to form a first region of recrystallized material of a selected portion of the second body having solid solubility of the metal of the layer therein of the second body and to form a second region of recrystallized material of the second body having solid solubility of the metal layer therein, the solid solubility metal imparting a selected conductivity and a selected level of resistivity to the two regions, the first and second regions being integral with each other, substantially free of metal inclusions, and having the crystalline structure of the second body, and

g. joining together the two bodies of semiconductor material by the integral regions of recrystallized semiconductor material.

3,956,024

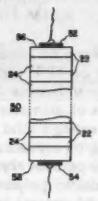
PROCESS FOR MAKING A SEMICONDUCTOR VARISTOR EMBODYING A LAMELLAR STRUCTURE

Harvey E. Cline, and Thomas R. Anthony, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 411,016, Oct. 30, 1973, abandoned. This application Nov. 29, 1974, Ser. No. 528,253

Int. Cl.² H01L 7/34, 7/00

U.S. Cl. 148—1.5 **8 Claims**



1. A process for making a varistor comprising

a. selecting a body of semiconductor material having a predetermined level of resistivity, a predetermined type conductivity and two major opposed surfaces which are, respectively, the top and bottom surfaces thereof;

b. vapor depositing an array of metal wires having a selected configuration on a major surface of the body;

c. heating the body and the array of metal wires to a predetermined elevated temperature sufficient to form an array of liquid wires of metal-rich semiconductor material on the surface of the body;

d. establishing a temperature gradient in the body substantially perpendicular to the two opposed major surfaces, the major surface having the array of liquid wires being at the lower temperature;

e. migrating the array of liquid metal wires entirely through the body from the major surface of lower temperature to the major surface of high temperature;

f. forming a plurality of spaced regions of recrystallized semiconductor material of the body having solid solubility of the metal of the liquid wire therein, each region being formed by the migration of one particular liquid wire, the metal having at least one material therein of a predetermined level of concentration as determined by the temperature of migration to impart a predetermined level of resistivity and a predetermined type conductivity to the recrystallized material which is opposite to that

type conductivity of the body thereby forming a plurality of P-N junctions substantially perpendicular to the major surfaces, each P-N junction being formed at the interface of each pair of abutting surfaces of semiconductor material of opposite type conductivity, and the spaced regions, in conjunction with the original material of the body, forming a plurality of integral regions of alternate and opposite type conductivity arranged in a series electrical circuit arrangement, and

g. affixing two electrical contacts to the body wherein one contact is in electrical contact with a region of recrystallized material, the second contact is in electrical contact with a region of original semiconductor material of the body, and a predetermined number of regions of opposite type conductivity and the associated P-N junctions are biased by application of a source of electrical energy to the electrical contacts.

3,956,025

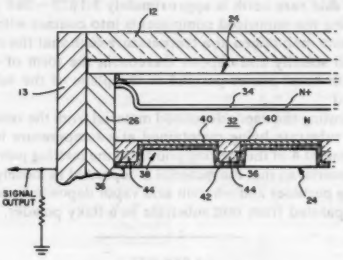
SEMICONDUCTOR DEVICES HAVING SURFACE STATE CONTROL AND METHOD OF MANUFACTURE

Hermann Statz, Wayland, and Wolfgang M. Feist, Burlington, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Division of Ser. No. 365,927, June 1, 1973, abandoned. This application Mar. 25, 1974, Ser. No. 454,647

Int. Cl.² H01L *21/265*

U.S. Cl. 148—1.5 **13 Claims**



11. The method comprising the steps of:

forming a semiconductor body; and

forming one or more barrier junctions with said body by forming a thin layer of insulating material on said body and forming a layer of high resistance material on said layer of insulating material.

3,956,026

MAKING A DEEP DIODE VARACTOR BY THERMAL MIGRATION

Harvey E. Cline, and Thomas R. Anthony, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 411,149, Oct. 30, 1973. This application Nov. 29, 1974, Ser. No. 528,235

Int. Cl.² H01L *7/34, 7/00*

U.S. Cl. 148—1.5 **23 Claims**

1. A process for making a semiconductor device comprising the process steps of:

a. selecting a body of single crystal semiconductor material having

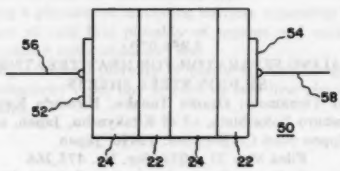
1. two major opposed surfaces comprising, respectively, the top and bottom surfaces thereof,
2. a selected level of resistivity,
3. a selected type conductivity, and
4. a preferred planar crystal structure orientation of at least one of the major opposed surfaces, the planar crystal structure orientation being one selected from the group consisting of (111), (100) and (110);

b. orienting the body so that the vertical axis of the body is substantially aligned with a first axis of the crystal structure which is substantially perpendicular to the at least one major opposed surface having the preferred planar crystal structure orientation;

c. disposing at least one metal wire of a selected metal composition on the surface having a preferred planar orientation, each metal wire having a preferred stable wire direction which is dependent on the planar orientation of the major surface;

d. heating the body and the at least one metal wire to a temperature sufficient to transform the metal wire into a melt of metal-rich semiconductor material on the major surface;

e. establishing a thermal gradient substantially parallel to the vertical axis of the body and the first axis of the crystal body;



f. thermal migrating the at least one melt of metal wire of selective metal through the body in the direction of the higher temperature of the thermal gradient from the one major surface to, and terminating in, the other of the two major opposed surfaces to form at least one region of recrystallized material of the body having solid solubility of the selective metal therein and a second and opposite type conductivity than the body and thereby forming a P-N junction at the contiguous surfaces of the at least one region and the body;

g. affixing a first ohmic electrical contact to one of the regions of recrystallized semiconductor material of the body, and

h. affixing a second ohmic electrical contact to a selective portion of the original material of the body, the first and second contact arrangements being such as to cause the processed body to function as a varactor when voltage is applied across the two ohmic electrical contacts.

3,956,027

PROCESSING COPPER BASE ALLOYS

Prakash D. Parikh, and Eugene Shapiro, both of Hamden, Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Apr. 9, 1975, Ser. No. 566,273

Int. Cl.² C22F *1/08*

U.S. Cl. 148—11.5 R **11 Claims**

1. A process for obtaining an improved combination of bend and strength properties in copper base alloys which comprises providing a copper base alloy strip having a thickness of less than 0.500 inch, subjecting said strip to a final cold reduction with a total reduction of at least 15% using several passes at least five of said passes having a per pass reduction varying from 0.5 to 4.0%.

3,956,028

TEMPORARY SCALE RETARDANT COATINGS

William E. Boggs, Franklin Boro; William A. Linderman, North Versailles Township, Allegheny County, and Roland B. Snow, Mount Lebanon, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 291,849, Sept. 25, 1972, Pat. No. 3,827,922. This application May 28, 1974, Ser. No. 473,543
Int. Cl.² B23K *35/24*
U.S. Cl. 148—27 10 Claims

1. A composition for effectively retarding the formation of scale at temperatures in excess of about 2150°F, comprising a solids fraction in suitable vehicle, said solids fraction amounting to from about 10 to about 80 percent of the total, and consisting essentially of

a. 75 to 95 percent MgO,
b. 2 to 10 percent B_2O_3,
c. about 6 to about 12 percent C, and
d. less than 2 percent SiO_2.

3,956,029

ANNEALING SEPARATOR FOR HEAT TREATMENT OF SILICON STEEL SHEETS

Takaaki Yamamoto; Osamu Tanaka; Hirotada Katoh, and Shozaburo Nakashima, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed May 31, 1974, Ser. No. 475,266
Claims priority, application Japan, June 7, 1973, 48-64085
Int. Cl.² B23K *35/24*
U.S. Cl. 148—27 2 Claims

1. An annealing separator composition for heat treatment of a silicon steel sheet consisting essentially of not more than 0.2% SO_3, not more than 0.04% Cl, not less than 94% of MgO having a water of hydration of less than 4%, and unavoidable impurities, and having a bulk density between 0.18 and 0.30 g/cm³, and a particle size distribution of 40 to 70% of particles not larger than 3 μm, 10 to 25% of particles not smaller than 10 μm, not more than 15% of coarse particles larger than 15 μm with the balance being intermediate particles between 3 μm and 10 μm.

3,956,030

COATINGS FOR FERROUS SUBSTRATES

Leonard S. Lee, Daly City; Howard M. Siegel, Pacifica, and Samuel W. Sopp, Foster City, all of Calif., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 524,015, Nov. 15, 1974, which is a continuation-in-part of Ser. No. 373,728, June 26, 1973, abandoned. This application June 27, 1975, Ser. No. 591,195
Int. Cl.² B23K *35/24*
U.S. Cl. 148—27 3 Claims

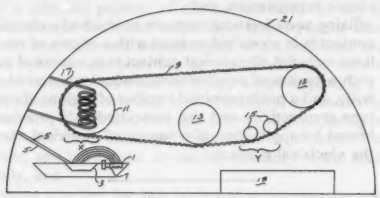
1. A composition for coating magnetic ferrous material prior to the step of annealing said material comprising MgO, $Mg(OH)_2$ or mixtures thereof, at least one boron compound and at least one amorphous magnesia-silica complex wherein the mole-ratio of the $MgO:SiO_2$ is from about 1:25 to 14:1, said complex containing from about 0.001 to 2.0% weight of an alkali metal oxide or hydroxide, said magnesia-silica complex being amorphous as indicated by its X-ray powder diffraction pattern and exhibiting the following differential thermal behavior characteristics: an endothermic peak at about 250°C., an exothermic peak at about 820°C. and at about 980°C.

3,956,031

MAGNETIC MATERIALS AND THE FORMATION THEREOF

Harris L. Marcus, Thousand Oaks, Calif., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 24, 1969, Ser. No. 887,833
Int. Cl.² H01F *1/02*
U.S. Cl. 148—103 4 Claims



1. The method of producing a magnetic material which is adapted to display a high magnetic anisotropy when subjected to a magnetic field for orienting the crystals thereof, said method comprising:

establishing a vapor phase of the components of a material characterized by high crystalline magnetic anisotropy, said material comprising an intermetallic compound of a rare earth and cobalt wherein the atomic ratio of cobalt to said rare earth is approximately 5:1;

passing the vaporized components into contact with a substrate maintained at a temperature such that the material will solidify and deposit thereon in the form of crystals with basal planes parallel to the plane of the substrate; and

separating the vapor deposited material from the substrate;

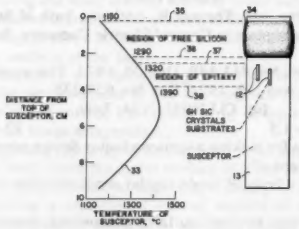
said substrate being maintained at a temperature between about 0.4 of the melting point and the melting point of the material so that the material is deposited as loosely adhering particles and wherein said vapor deposited material is separated from said substrate as a flaky powder.

3,956,032

PROCESS FOR FABRICATING SIC SEMICONDUCTOR DEVICES

J. Anthony Powell, and Herbert A. Will, both of N. Olmsted, Ohio, assignors to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Sept. 24, 1974, Ser. No. 508,784
Int. Cl.² H01L *21/205*; C01B *31/36*
U.S. Cl. 148—175 20 Claims



1. A method for epitaxially growing SiC having at least one face substantially parallel to the crystal c-axis;

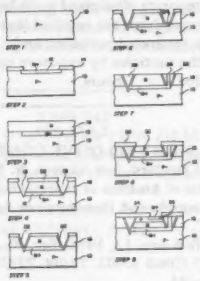
providing an elongated susceptor of a material which is substantially inert below a temperature of 2000° C and having a first end and a second end;

attaching said substrate to said susceptor between said first and second ends;
disposing said elongated susceptor and attached substrate in an elongated chamber;
passing hydrogen over said one face of said substrate;
heating at least a portion of said susceptor to establish a temperature gradient between said first and second ends; and
passing a gas mixture comprised of hydrogen and a carbon containing chlorosilane over said susceptor and said substrate in a direction from said first end toward said second end, said temperature gradient being such that free silicon is deposited in a band at said first end of said susceptor and crystal growth on said substrate is effected.

3,956,033
METHOD OF FABRICATING AN INTEGRATED SEMICONDUCTOR TRANSISTOR STRUCTURE WITH EPITAXIAL CONTACT TO THE BURIED SUB-COLLECTOR

Donald K. Roberson, Scottsdale, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Division of Ser. No. 430,434, Jan. 3, 1974, Pat. No. 3,913,124. This application Dec. 4, 1974, Ser. No. 529,421
Int. Cl.² H01L *21/76, 27/04*
U.S. Cl. 148—175 **5 Claims**

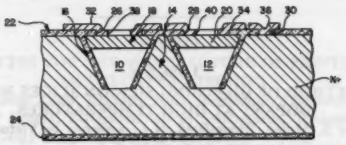


1. A method for fabricating an integrated semiconductor structure comprising the steps of:
a. forming a region of first conductivity type extending from a surface of a monocrystalline semiconductor substrate of second conductivity type into said substrate,
b. forming a monocrystalline epitaxial layer of said first conductivity type over said surface, including said region of first conductivity type,
c. etching a groove through said monocrystalline epitaxial layer to expose a portion of said region of first conductivity type and isolate a portion of said epitaxial layer from the remainder of said epitaxial layer,
d. forming a dielectric layer within said groove,
e. forming an opening in said dielectric layer to reexpose a portion of said region of first conductivity type,
f. depositing doped semiconductor material of said first conductivity type and having an upper surface in said groove to form simultaneously a body of high conductivity, monocrystalline semiconductor material contacting said region of first conductivity type through said opening and extending to the upper surface of said doped semiconductor material, and a body of polycrystalline semiconductor material surrounding said body of monocrystalline semiconductor material in said groove, and
g. forming at least one region of second conductivity type in said isolated portion of said epitaxial layer to provide a semiconductor device.

3,956,034
ISOLATED PHOTODIODE ARRAY

Hugh Crawford Nicolay, Melbourne, Fla., assignor to Harris Corporation, Cleveland, Ohio

Division of Ser. No. 380,611, July 19, 1973, Pat. No. 3,886,587. This application Mar. 27, 1975, Ser. No. 562,849
Int. Cl.² H01L *21/20*
U.S. Cl. 148—175 **8 Claims**

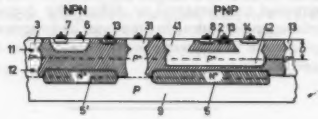


1. A process for fabricating a radiation sensitive device which comprises:
forming a first plurality of regions of one conductivity type at a first planar surface of a polycrystalline semiconductor of said one conductivity type;
forming a plurality of insulating barriers separating lateral edges of said first plurality of regions and said polycrystalline semiconductor; and
forming a second plurality of planar regions of opposite conductivity type, one at each of said first plurality of regions.

3,956,035
PLANAR DIFFUSION PROCESS FOR MANUFACTURING MONOLITHIC INTEGRATED CIRCUITS

Hans Herrmann, Heinrich-Heine-Strasse 9, D-783 Emmendingen, Germany

Filed Oct. 1, 1974, Ser. No. 510,929
Claims priority, application Germany, Oct. 17, 1973, 2351985
Int. Cl.² H01L *21/76, 21/20*
U.S. Cl. 148—175 **1 Claim**



1. A process for manufacturing a monolithic integrated circuit including at least one npn transistor and one pnp transistor comprising:
prediffusing into the surface of a substrate having a first conductivity type, two spaced buried regions of a second conductivity type;
epitaxially growing a first partial layer of said first conductivity type on said substrate;
simultaneously diffusing into said first partial epitaxial layer a sub-collector zone of said first conductivity type above one of said buried regions and a sub-insulating zone extending between said buried layers;
epitaxially growing a second partial layer on said first partial layer containing said sub-collector and sub-insulating zone, said sub-collector and sub-insulating zone outdiffusing into said second partial layer during the epitaxial growth;
simultaneously diffusing into said second partial layer an insulating zone which contacts said outdiffused insulating region, a base region above the other of said buried layers, said base region forming the base of said npn transis-

tor, and frame-like contacting zones extending into said second partial layer and contacting said outdiffused subcollector at its extremities, thus forming above said subcollector and within said contacting zones a base region of said pnp transistor;

diffusing an emitter region into the base region of said npn transistor;

diffusing an emitter region into the base region of said pnp transistor.

3,956,036

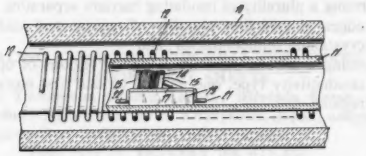
METHOD OF DIFFUSING SILICON SLICES WITH DOPANT AT HIGH TEMPERATURES

Casper S. Molee, Bloomfield, N.J., assignor to Victory Engineering Corporation, Springfield, N.J.

Filed Feb. 10, 1975, Ser. No. 548,358

Int. Cl.² H01L *7/34*

U.S. Cl. 148—188 **8 Claims**



1. A method of diffusing a plurality of crystal silicon slices with doping material to control the electrical characteristics of the silicon for subsequent passage of electrical current, said method including the application of doping material to the surface of all the slices; stacking the slices under pressure with the doping material surfaces adjoining each other in a refractory boat; slowly moving the boat and the stacked slices into a furnace to increase the temperature of the slices at a predetermined rate; maintaining the boat and slices in a doping zone at a diffusion temperature of the order of 1350° celsius for a predetermined time interval to diffuse the dopant into the slice surface; and withdrawing the boat and slices slowly from the doping zone to a lower temperature zone at a predetermined speed.

3,956,037

METHOD OF FORMING SEMICONDUCTOR LAYERS BY VAPOR GROWTH

Takashi Ishii; Kazuhisa Takahashi, and Akihiro Kondo, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 11, 1974, Ser. No. 460,052

Claims priority, application Japan, Dec. 26, 1973, 49-2161

Int. Cl.² H01L *7/44*

U.S. Cl. 148—189 **6 Claims**

1. A method of forming a semiconductor layer by vapor growth, comprising the steps of:

forming a second semiconductor layer on a first thin semiconductor layer by vapor growth, the impurity concentration being different but of the same conductivity type in the twp semiconductor layers;

controlling the impurity concentration level by supplying a carrier gas and a doping gas of given concentrations before the vapor growth of the second semiconductor layer starts;

maintaining the temperature constant throughout the process.

3,956,038

PROCESS FOR OBTAINING COATED PYROTECHNIC COMPOSITIONS

Jean René Duguet, Sarniguet, and Marie Louise Sanmartin, Semeac, both of France, assignors to Etat Francais, Paris, France

Filed Mar. 14, 1974, Ser. No. 451,150

Claims priority, application France, Mar. 15, 1973, 73.09221

Int. Cl.² C06B *45/36*

U.S. Cl. 149—4 **10 Claims**

1. A process for preparing a powdered pyrotechnic composition comprising free particles of at least one pyrotechnic substance, all of said particles characterized by having a size less than 500 microns, being coated with a polymeric binder, having a continuous closed curved convex surface, having a minimum sensitivity to friction of 150g., and having a ratio of the extreme dimensions of the particles up to 2/1, said process comprising the steps of:

dissolving the coating polymer in an ionic or non-ionic solvent in a concentration of 2 to 20 percent by weight,

introducing 10 to 60 percent by weight of a powdered pyrotechnic substance with sufficient agitation to maintain a homogeneous dispersion of the particles in the coating polymer solution,

progressively adding with agitation one or more viscous liquid antagonistic polymers for which said solvent has greater affinity than for said coating polymer to obtain a weight concentration between 20 and 60 percent of the total weight of the solvent, polymer and pyrotechnic substance;

filtering to separate plasticized particles of coated pyrotechnic substance from the residual liquid phase;

washing the separated particles; and

hardening the particles by exposure to air or to the heat of an oven for 2 to 3 hours.

3,956,039

HIGH EXPLOSIVE COMPOUND

Theodore C. Crawford, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Jan. 13, 1956, Ser. No. 559,081

Int. Cl.² C06B *45/02, 25/04, 23/00;* **C01B** *35/10*

U.S. Cl. 149—21 **2 Claims**

1. A low detonation velocity explosive consisting essentially of a particulate mixture of ortho-boric acid and trinitrotoluene, said mixture containing from about 25 to about 65 percent by weight of ortho-boric acid, said ortho-boric acid comprised of from 60 to 90 percent of spherical particles having a mean particle size of about 275 microns and 10 to 40 percent of spherical particles having a particle size less than about 44 microns.

3,956,040

EXPLOSIVE SLURRY COMPOSITION CONTAINING SODIUM MONTMORILLONITE

Hiroshi Tezuka, Tokyo, Japan, assignor to Gelan Kabushiki Kaisha, Tokyo, Japan

Filed July 16, 1974, Ser. No. 488,992

Claims priority, application Japan, July 24, 1973, 48-82699; July 24, 1973, 48-82700

Int. Cl.² C06B *33/14, 31/28, 31/12;* **C09K** *7/00*

U.S. Cl. 149—41 **19 Claims**

1. A explosive composition which comprises an aqueous slurry of:

a. at least one inorganic oxidizing salt; and

b. a complex of sodium montmorillonite and a water-soluble organic compound containing at least one $-NH_2$, -OH or $-SO_3H$ group, said complex being in the form of a water-swollen gel in which the sodium montmorillonite: water weight ratio is between about 10:90 and 15:85.

3,956,041
TRANSFER COATING PROCESS FOR MANUFACTURE OF PRINTING CIRCUITS

Joseph Polichette, South Farmingdale; Edward J. Leech, and Frederick W. Schneble, Jr., both of Oyster Bay, all of N.Y., assignors to Kollmorgen Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 270,660, July 11, 1972, abandoned. This application Aug. 23, 1974, Ser. No. 499,986

Int. Cl.² H05K *3/18*; **B05D** *7/24*; **C23C** *3/02*; **H05K** *3/00*

U.S. Cl. 156—3 **9 Claims**

1. A process for the manufacture of printed circuits having improved adhesion between the metallic circuit conductor pattern and an insulating base, which comprises coating the surface of a transfer base material with a layer of a viscous, liquid incompletely polymerized composition containing a resin hardenable by polymerization or cross-linking, said resin selected from the group consisting of phenolics, polyepoxides, melamines, polyacrylics, polyacrylates, polyesters, nitrile rubber, curable polystyrene resins, and mixtures thereof, said transfer base material being removable from the coating layer in its hardened state, partially hardening the composition to a degree whereby adjacent coated surfaces will not adhere to each other, thereafter bringing the partially hardened coated surface of said transfer base material into close contact with the surface of a permanent insulating base material, said permanent insulating base material adhering to the coating layer in its hardened state, completing the hardening of said coating layer by heating, removing the transfer base material to produce an insulating base material having a resin rich, hardened coating layer, producing either a permanently polarized, wettable surface or a microporous surface on the hardened coating layer on said insulating base, and generating a metallic conductor pattern in selected areas on the permanently polarized, wettable or microporous surface of the hardened coating on the insulating base.

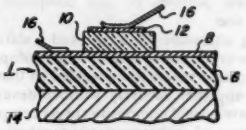
3,956,042
SELECTIVE ETCHANTS FOR THIN FILM DEVICES

David D. Thornburg, Los Altos, and Richard I. Johnson, Menlo Park, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 7, 1974, Ser. No. 521,591

Int. Cl.² H01L *21/12*

U.S. Cl. 156—3 **1 Claim**



1. A method of masking a non-rectifying solid state device having a desired voltage-current characteristic comprising:

providing a thin-film structure comprised of a body of a chalcogenide glass which is bounded on a first side by a first electrode and on a second side opposed to said first side by a second electrode,

forming a first pattern of a protective photoresist over a portion of said first electrode,

applying a first etchant to the unprotected portion of said first electrode, said first etchant selectively etching through the unprotected portion of said first electrode without etching any portion of said body of chalcogenide glass to provide said first electrode with a desired surface geometry,

removing said first pattern of protective photoresist,

forming a second pattern of protective photoresist over said first electrode of said desired surface geometry and over a portion of said first side of said body of chalcogenide glass adjacent said first electrode of said desired surface geometry, and

applying a second etchant to the unprotected portion of said first side of said body of chalcogenide glass, said second etchant selectively etching through said body of chalcogenide glass without etching any portion of said second electrode, whereby the outer boundary of said etched body of chalcogenide glass extends beyond said desired surface geometry of said first electrode.

3,956,043
PROCESS FOR THE MANUFACTURE OF PRINTED MULTI-LAYER CIRCUITS

Abdul-Cader Zahir, Reinach; Heinz Remabold, Arlesheim, and Ewald Losert, Birsfelden, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 20, 1973, Ser. No. 389,910

Claims priority, application Switzerland, Aug. 25, 1972, 12658/72

Int. Cl.² G03C *1/68*

U.S. Cl. 156—3 **11 Claims**

1. Process for the manufacture of printed multi-layer circuits by coating carrier films, which possess metal which can be etched, with a light-sensitive material, exposing the light-sensitive material through a transparent film which shows the negative image of the conductor traces to be produced, developing with an organic solvent, whereby the unexposed parts of the light-sensitive material are dissolved out, treating the metal layers with an etched liquid and pressing the structures together to form a multi-layer circuit, characterized in that the light-sensitive material used is a compound containing epoxy groups and groups which can be cured by electromagnetic rays, said compound containing from 0.1 to 3.0 epoxide group equivalent/kg, that the parts of the light-sensitive layer which have been pre-cured by exposure to light are subjected to a thermal after-treatment using a thermally active curing agent for epoxide resins, whereby these parts are post-cured, and that these parts are left on the carrier films.

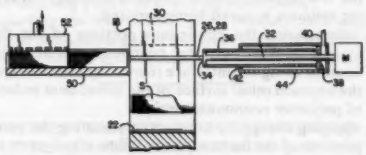
3,956,044
METHOD AND MEANS FOR FABRICATING SURGICAL SPONGES

Leonard C. Bowen, Avon, and Reginald R. Gallant, Rocky Hill, both of Conn., assignors to Surgicot, Inc., New York, N.Y.

Filed May 15, 1974, Ser. No. 470,147

Int. Cl.² B29C *27/08*

U.S. Cl. 156—73.2 **9 Claims**



4. An apparatus for fabricating surgical sponges and comprising:

a. support means for receiving a length of woven sponge strip,

b. vertically reciprocable means for engaging a medial segment of said strip intermediate its ends,

c. elongated cavity defining structure in the path of movement of said vertically reciprocable means for receiving the strip and folding it in the cavity in response to movement of said reciprocable means in one direction,

d. said cavity defining structure further including a generally cylindrical enlargement thereof, the axis of which

enlargement is perpendicular to the longitudinal dimension of said elongated cavity, and

e. fork means selectively rotatable on said axis, said fork means including two tines between which said vertically reciprocable means is adapted to fold said strip in said cavity when said fork means is not rotating.

8. Apparatus according to claim 4 wherein said strip of woven material includes at least one thread of synthetic thermoplastic material, and means for ultrasonically welding the free edge of said rolled strip.

3,956,045
METHOD AND APPARATUS FOR BONDING LAYERS OF RESINOUS MATERIAL

Louis S. Hoffman, Evans Farm Road, Morristown, N.J. 07960

Continuation of Ser. No. 210,523, Dec. 21, 1971, abandoned.
This application Mar. 25, 1974, Ser. No. 454,714
Int. Cl.² B32B *31/16*; B29C *19/02*; C09J *5/00*
U.S. Cl. 156—73.4 **13 Claims**

2. A method for bonding portions of first and second films of polyester resinous material to one another, the polyester resinous material being of a type which is not bondable by application of conductively transferred heat and pressure directly to only the two films by reason of deterioration of the two films about the periphery of the seal zone when the heat and pressure are applied, the method comprising the steps of:

a. providing at least first and second films of polyester resinous material to be bonded to one another and at least one direct-heat isolating film of polyester resinous material;

b. disposing a portion of one surface of the first film of polyester resinous material contiguous with a portion of one surface of the second film of polyester material for forming an interface between the contiguous portions;

c. placing one surface of the direct-heat isolating film of polyester resinous material adjacent the other surface of the portion of at least one of the first and second films of polyester resinous material disposed contiguous with the portion of the other film of polyester resinous material, the one surface of the direct-heat isolating film of polyester resinous material being exposed;

d. compressing the contiguous portions of the first and second films of polyester resinous material against one another along the interface thereof by pressure applied to the exposed other surface of the direct-heat isolating film of polyester resinous material;

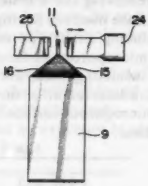
e. applying energy for conductively heating the contiguous portions of the first and second films of polyester resinous material along their interface to raise the temperature thereof to at least the bonding temperature of the polyester resinous material of the first and second films of polyester resinous material and to cause a bond to be formed between the contiguous portions of the first and second films of polyester resinous material, the energy being applied by a member having a face portion which is moved directly into contact with the other surface of the direct-heat isolating film of polyester resinous material for conductively transmitting energy for heating by conduction through the exposed other surface of the direct-heat isolating film of polyester resinous material, the applied energy being sufficient to fuse the direct-heat isolating film of polyester resinous material against the other surface of the one of the first and second films of polyester resinous material to enhance the transfer of energy for heating the contiguous portions of the first and second films to the bonding temperature while causing the direct-heat isolating film to be bonded to the other surface, the direct-heat isolating layer preventing the region of the first and second films adjacent the bond formed therein from being raised to a temperature which would cause degradation thereof; and

f. discharging the bonded first and second films of polyester resinous material and the bonded direct-heat isolating film of polyester resinous material through which the energy has been applied from the location at which the bond is formed.

3,956,046
METHOD FOR ULTRASONICALLY WELDING COMPOSITE SHEET MATERIAL

Kanji Tsuchiya, No. 25-4, Asagayaminami 2-chome, Suginami, Tokyo, and Hitoshi Shukuya, No. 203, Oume, Oume, Tokyo, both of Japan

Continuation-in-part of Ser. No. 214,931, Jan. 3, 1972, abandoned. This application July 12, 1974, Ser. No. 488,029
Int. Cl.² B32B *31/22*
U.S. Cl. 156—73.4 **2 Claims**



1. A method for ultrasonically welding composite sheet material comprising the steps of:

a. placing portions of the composite sheets to be welded in overlapped relationship with each other;

b. positioning the overlapped portions of the composite sheets to be welded between an ultrasonic vibrator and a working table, at least one of which has a working surface configurated to conform with a varying thickness of the overlapped portions of said composite sheets to be welded; and

c. applying ultrasonic vibrations and a static pressure uniformly over the entire area of said overlapped portions of the composite sheets to be welded so that the sheets are bonded together securely without developing any pin holes therein; said composite sheets comprising a continuous phase of a thermoplastic synthetic resin selected from the group consisting of polyethylene, polypropyrene, polystyrene, polyvinyl acetate, polyvinyl chloride, polyvinyl alcohol, methacrylic acid ester and polycarbonate and fine powder of an inorganic material uniformly dispersed in said continuous phase of said thermoplastic synthetic resin and selected from the group consisting of calcium sulfate, talc, carbon, bentonite and silica.

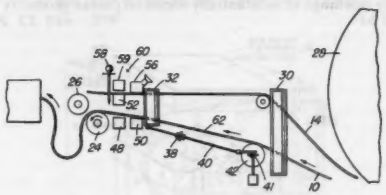
3,956,047
METHOD AND APPARATUS FOR BUTT WELDING THERMOPLASTICS SHEETS AND FILMS

David Emil Johnson, Macedon, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 1, 1974, Ser. No. 438,925
Int. Cl.² B65H *69/06*
U.S. Cl. 156—159 **2 Claims**

1. A method of thermally splicing together the edges of a first and second thermoplastic foam sheet, comprising sequentially (a) providing a first and second thermoplastic foam

sheet to be spliced, (b) providing at least two spaced-apart pair of edge guide means abutting said sheets at their respective lateral edges to laterally and axially align said first and second sheets to be spliced prior to splicing, (c) completely transversely severing the leading section of said first thermoplastic foam sheet with a heated element to expose a transverse edge of said first sheet to be spliced, (d) completely transversely severing, by continued movement of said heated



element, the trailing section of said second thermoplastic foam sheet to expose a transverse edge of said second sheet to be spliced, (e) moving said heated element in the reciprocal direction adjacent the exposed transverse edges to heat said edges to a temperature sufficient for the edges to be thermally welded, and (f) bringing the heated transverse edges into abutting relationship to thermally weld said edges together, while maintaining the sheets aligned with said edge guide means.

3,956,048

METHOD FOR THE MANUFACTURING OF A DISPOSABLE OPERATION TEXTILE

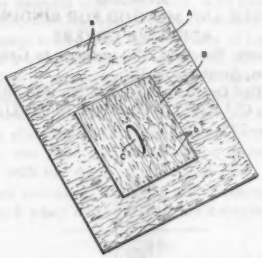
Gunnar Nordgren, Paivarinta, Finland, assignor to Oy Suomen Vanutehdas-Finnwad Ltd., Helsinki, Finland

Filed Sept. 9, 1974, Ser. No. 504,209

Claims priority, application Finland, Sept. 11, 1973, 2826/73

Int. Cl.² A61F *13/00*; B29F *3/00*; B32B *31/12*

U.S. Cl. 156—183 **8 Claims**



1. A method of manufacturing disposable textile sheets for surgical operations, which comprises the combination of the following steps:

a. coating a side of a web of non-woven rayon fiber fabric, having the fibers thereof principally oriented in one direction, by extruding thereon a molten heat-sealable layer of synthetic material under tension selected from polyethylene and polypropylene;

b. cooling said coated web to produce and fix in said layer an internal prestress;

c. superimposing the coated side of said cooled coated web onto another web of non-woven rayon fiber fabric having the fibers thereof principally oriented in a direction substantially perpendicular to the orientation direction of the fibers of the coated web; and

d. applying heat and compression to said superimposed webs whereby said webs are heat sealed together.

3,956,049

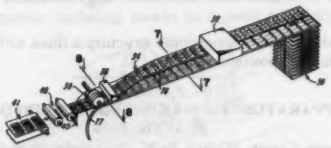
CONTINUOUS BUSINESS FORM OR THE LIKE ADAPTED FOR SUBSEQUENT PROCESSING INTO ORIGINAL INDICIA BEARING LOTTERY TICKETS, ENVELOPES OR THE LIKE

Edward L. Johnsen, 12 Fox Meadow Lane, Wayland, Mass. 01778

Filed Jan. 15, 1974, Ser. No. 433,464

Int. Cl.² A63B *71/00*; B31F *1/00*

U.S. Cl. 156—200 **10 Claims**



1. A method of producing a series of interconnected blanks suited for processing into individual envelopes, lottery tickets or like articles, each containing original indicia, which comprises the steps of:

a. continuously advancing an endless web of material toward an accumulating station;

b. transversely subdividing said web into a series of interconnected blanks, the width of each of which is defined by an uneven number of longitudinal panels wherein each pair of adjacent non-abutting panels are interconnected by an intermediate discardable panel;

c. selectively applying an adhesive to portions of an upper surface of an edge-adjacent panel of the web;

d. folding at least one edge-adjacent panel of the web onto and in direct overlying relationship with an adjoining intermediate discardable panel and in side-by-side juxtaposition with an adjacent non-abutting panel wherein the then exposed upper surfaces of said juxtaposed panels are positioned to receive original, directly applied indicia;

e. accumulating said series of interconnected blanks for further processing; and thereafter

f. continuously advancing said interconnected blanks toward an indicia applying station;

g. applying original indicia directly to the exposed upper surface of at least one of said juxtaposed panels;

h. superposing and permanently bonding said adjacent non-abutting panels in overlying relationship;

i. discarding the intermediate panel between each adjacent pair of non-abutting panels thereby completing a series of interconnected envelopes, lottery tickets or like articles.

3,956,050

VACUUM PRESSURE MOLDING TECHNIQUE

Marvin B. Dow; Harold G. Bush, both of Newport News; William M. Haraway, Jr., Hampton, all of Va., and John F. Crumpler, deceased, late of Hampton, Va. (by Doris L. Crumpler, beneficiary), assignors to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 24, 1974, Ser. No. 436,317

Int. Cl.² B32B *3/12*; B64G *1/30*

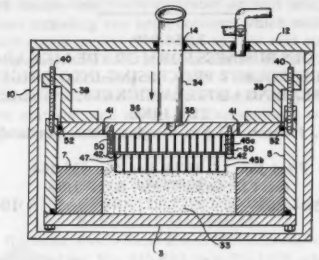
U.S. Cl. 156—242 **8 Claims**

1. A method of making a thermal insulating ablation honeycomb structure comprising the steps of:

a. drawing a vacuum in a mold structure,

b. filling said mold structure with a pressure load rate sensitive ablation material composition while said mold structure is under vacuum,

c. forcing said honeycomb structure into said filled mold structure while said mold structure is under vacuum



whereby said honeycomb structure is filled with the material composition.

3,956,051

APPARATUS FOR MAKING FIBER REINFORCED PLASTIC PIPE

J. Warne Carter, Wichita Falls, Tex., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 824,153, May 13, 1969, Pat. No. 3,700,519, which is a continuation-in-part of Ser. No. 577,035, Sept. 2, 1966, Pat. No. 3,507,412, which is a continuation-in-part of Ser. No. 387,372, Aug. 4, 1964, abandoned. This application Apr. 14, 1972, Ser. No. 243,991

Int. Cl.[2] B65H *81/08*

U.S. Cl. 156—429 **39 Claims**

1. Apparatus for the continuous manufacture of substantially rigid, fiber reinforced plastic pipe comprising an axially fixed, hollow mandrel mounted for rotation, means for directing air under pressure axially through the mandrel and out from the forward end thereof, means for providing an air impervious conveyor tube on the mandrel, seal means on the exterior of the mandrel cooperable with the interior of the conveyor tubes as the conveyor tube is advanced over the mandrel, means for winding a plurality of bands of thermosetting resin composition impregnated continuous fiber elements onto the conveyor tube to provide a pipe assembly, means for rotating the pipe assembly, means for curing the thermosetting resin composition to provide a substantially rigid pipe assembly, plug seal means insertable in the forward end of the pipe assembly being generated and movable therewith, the pipe assembly together with said seal means on the mandrel and said plug seal means providing a sealed chamber whereby the air under pressure provides an axially directed thrust to linearly advance the pipe assembly, control means gripping the pipe assembly beyond the forward end of the mandrel and rearward of the forward end of the pipe assembly to control the rate of linear advancement of the pipe assembly, and means cooperable with the interior of the pipe assembly to provide a temporary seal and prevent the loss of pressure within the advancing pipe assembly when a section thereof is cut and to allow repositioning of the plug seal means.

3,956,052

RECESSED METALLURGY FOR DIELECTRIC SUBSTRATES

Walter W. Koste, Wappinger Falls, and Ernest N. Urfer, Hopewell Junction, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 11, 1974, Ser. No. 441,196

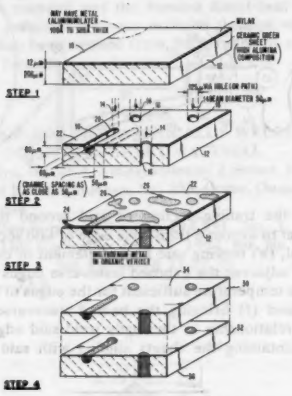
Int. Cl.[2] B32B *31/00*

U.S. Cl. 156—247 **1 Claim**

1. A method of depositing on a dielectric substrate recessed metallized interconnection channels and metallized vertical via conductive paths comprising the steps of:

a. laminating an organic masking layer onto a dielectric substrate;

b. thermally machining interconnection channels and vertical via paths through said masking layer into said dielectric substrate and simultaneously forming said organic masking layer into a self-registered mask, said mask having openings of substantially identical planar geometry to



that of the underlying interconnection channels and vertical via paths;

c. coating a metallic conductive material through said mask openings into said recessed interconnection channels and vertical via paths;

d. and peeling away said organic masking layer from said dielectric substrate; whereby said dielectric substrate has said recessed metallized interconnection channels and metallized vertical via paths formed therein.

3,956,053

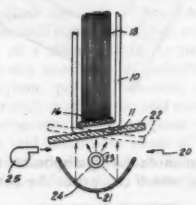
APPARATUS AND METHOD FOR BINDING WITH ADHESIVE COVERS

Henry N. Staats, Deerfield, Ill., assignor to General Binding Corporation, Northbrook, Ill.

Filed Oct. 15, 1974, Ser. No. 514,301

Int. Cl.[2] B29C *19/02*; B32B *19/02*, *31/00*

U.S. Cl. 156—272 **8 Claims**



6. In a method for binding sheet products in a substantially infrared transparent cover having a backbone portion and heat reactivatable adhesive on the cover backbone, the steps of:

placing the backbone of the cover loosely containing the sheet products to be bound therein upon a substantially infrared transparent support plate;

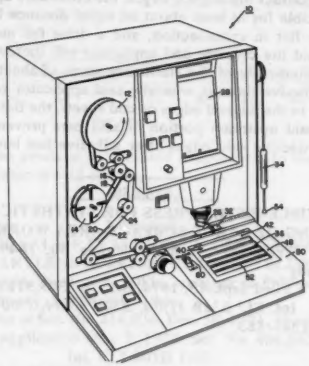
oscillating said plate during the binding process; and

while oscillating said plate, directing infrared heat energy through said plate and the cover to selectively melt the adhesive therein.

3,956,054
MICROFICHE CONVERTER AND UPDATER APPARATUS

Augustus W. Griswold, Rush, and Boris W. Haritonoff, Geneseo, both of N.Y., assignors to Arcata Microfilm Corporation, Long Beach, Calif.

Division of Ser. No. 268,792, July 3, 1972, Pat. No. 3,802,979. This application Oct. 4, 1973, Ser. No. 403,566
Int. Cl.² B32B *35/00*; G09F *9/42*, *13/10*
U.S. Cl. 156—379 **14 Claims**



1. Apparatus for making microfiche of the type including a transparent base and a plurality of parallel rows of microfilm frames mounted on the base, said microfilm frames including permanent frames that will never be updated and updatable frames that may be updated, said apparatus comprising:

a. a table top including a fiche deck;

b. a pair of registration pins extending upwardly from said fiche deck for use in mounting a microfiche base on said fiche deck in a predetermined orientation and registration;

c. a plurality of separate light sources arranged in a rectilinear array beneath said fiche deck, with one each of said light sources being approximately centrally positioned with respect to one each of a plurality of frame-receiving areas on a transparent base of microfiche; and

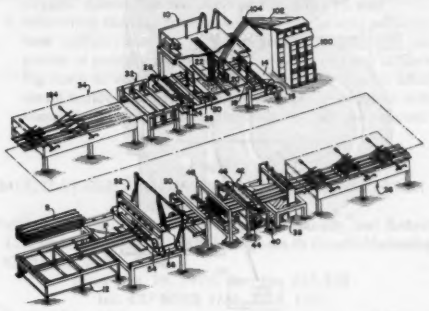
d. a plurality of solenoids connected to said table top beneath said fiche deck and each solenoid including a push pin connected thereto, and wherein said fiche deck includes a plurality of push pin clearance openings therethrough, one each of said clearance openings being in registry with one each of said push pins, whereby said push pins can move upwardly above the surface of said fiche deck when said solenoids are energized.

3,956,055
COMPOSITE PANEL AND SHAPE FORMING APPARATUS

Buddy L. Duft, Palm Springs; Steven I. Feher, Solana Beach, and Liberate Patag, San Diego, all of Calif., assignors to Material Systems Corporation, Escondido, Calif.

Filed Sept. 17, 1973, Ser. No. 397,780
Int. Cl.² B32B *31/06*; B44C *1/20*
U.S. Cl. 156—438 **10 Claims**

1. In an apparatus for manufacturing rigid structural flat sheet or shaped panels from a composite of reinforced resinous matrix material, the combination comprising: a material dispensing tower; support means for positioning supply rolls of lower and upper sheet material carriers respectively at the front and rear of said dispensing tower; a lower matrix dispenser including means to deposit a uniform coating of uncured resinous matrix material of predetermined thickness onto said lower carrier; means to distribute separated discrete reinforcing fibers uniformly over said matrix on said lower carrier and comprising cutter means for drawing a plurality of continuous filaments from a supply and cutting said linear filaments into discrete fibers of preestablished lengths, means to regulate the quantity of said discrete fibers cut by said cutting means in accordance with the linear velocity of said carriers, a generally vertical chute for guiding said fibers from said cutter onto said lower matrix coating and means for neutralizing directional forces imposed on said cut fibers by said cutter, whereby said fibers are both uniformly distributed across the width of said matrix coating and deposited thereon with the same exclusively gravitation force; means on said tower downstream from said fiber distributing means in relation to carrier travel for impinging particularized filler against said fibers and matrix uniformly across the width of said matrix coating; an upper matrix dispenser including means to deposit a uniform uncured resinous coating of predetermined thickness to said upper carrier; means for bringing the coating on said upper carrier into overlying coextensive relation with said lower carrier sheet and the material thereon; means defining successive treatment and curing stations for converting said composite of matrix material and reinforcing fibers from a relatively pliable condition to a substantially rigid condition, said last mentioned means including a compactor station having means for kneading said composite between said upper and lower carriers thereby to mix the uncured resin, fiber and filler constituents thereof and to remove entrapped gas therefrom prior to curing; means for pulling said carriers from said supply rolls through said successive stations and carrier removal and storage roll take-up means following said pulling means by which said upper and lower carriers are removed from the cured rigid composite and stored for replacement of said supply rolls.



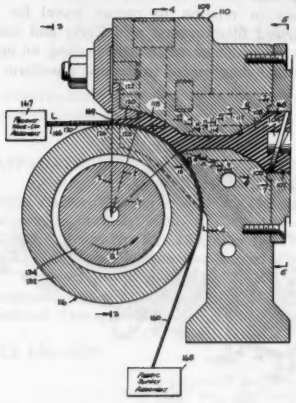
3,956,056
FABRIC COATING BY EXTRUSION DIE-CALENDERING APPARATUS AND METHOD

Jan Janusz Boguslawski, New York, N.Y.; Paul Geyer, Detroit, Mich., and Frederick Nishwitz Taff, Roxbury, Conn., assignors to Uniroyal Inc., New York, N.Y.

Division of Ser. No. 308,142, Nov. 20, 1972, Pat. No. 3,869,301. This application Sept. 27, 1974, Ser. No. 510,105
Int. Cl.² B29D *7/10*
U.S. Cl. 156—500 **13 Claims**

1. Apparatus for coating a warp and weft cord fabric with elastomeric stock wherein improved impregnation of the interstices between the warp and weft cords of the fabric is achieved, said apparatus comprising a roller, a primary and a secondary die segment each having a respective elastomeric stock wedging surface confronting said roller in spaced relation, said wedging surface of said primary die segment and a confronting arcuate segment of said roller cooperatively defining a convergent pressure chamber terminating in a restriction orifice which normally of said fabric is of wider extent than the thickness of said fabric, means for introducing a fabric into said chamber and onto said arcuate segment of said

roller to be carried by the latter to and through said restriction orifice, means for introducing elastomeric stock under pressure generally in the direction of advancement of and upon said fabric upstream of said chamber to at least partially impregnate interstices of said fabric upstream of said chamber, said secondary die segment abutting said primary die segment upstream of the latter and being spaced more remotely from said roller than said primary die segment, said wedging surface of said secondary die segment defining with said roller the region under pressure in which said stock at least partially impregnates said fabric upstream of said chamber, and drive



means for rotating said roller to frictionally carry and wedge both said fabric and the stock already having at least partially impregnated the interstices of said fabric into and through said chamber whereupon said stock increasingly impregnates the interstices in as well as the warp and weft cords of said fabric under increasing pressure in excess of the pressure at which said stock is initially urged by said wedging surface of said secondary die segment against said fabric upstream of said chamber and undergoes a reduction in cross-sectional thickness, said chamber having an elongate extent sufficient to enable said stock to resist substantial swelling after the latter issues with said fabric from said restriction orifice.

3,956,057

APPARATUS AND PROCESS FOR BINDING BOOKS WITH MOLTEN ADHESIVE

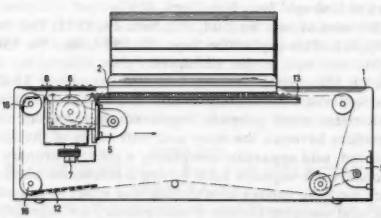
Dietrich Jung, In der Aue 1, 5202 St. Augustin, Germany

Filed Jan. 28, 1974, Ser. No. 437,582

Claims priority, application Germany, June 6, 1973, 2328723

Int. Cl.² B65C *11/04*

U.S. Cl. 156—578 **7 Claims**



1. An apparatus for gluing a stack of aligned sheets into a pad or book by applying a molten adhesive to the spine of the aligned sheets, comprising means for clamping said sheets with the aligned edges to be glued facing downwardly, a crucible for adhesive, means for melting said adhesive in said curcible, a glue applicator roll dipping into the molten adhesive in said curcible and extending above said adhesive, and means for moving said crucible with said applicator roll along the spine of the aligned sheets, said moving means comprising a pair of spaced parallel chains each resiliently connected to said crucible with said applicator roll, a plurality of cross-bars connecting said chains, the cross-bars downstream of said crucible, for a distance equal to at least about the length of the sheets to be glued, being substantially circular in cross-section so as to contact the aligned edges, the cross-bars upstream of said crucible for at least about an equal distance being substantially flat in cross-section, and a drive for moving said chains and the crucible and applicator roll therewith below and longitudinally of the stationary stack of sheets so as to apply adhesive thereto, whereby said applicator roll applies adhesive to the aligned edges of said sheets, the flat cross-section of said upstream portion of said bars preventing them from contacting said edges after adhesive has been applied thereto.

3,956,058

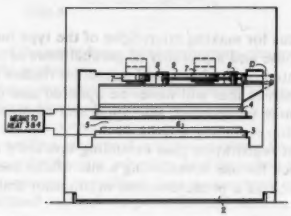
MULTIPLE-PISTON PRESS FOR SYNTHETIC-RESIN COATING OF LARGE SURFACE-AREA WORKPIECES

Heinrich Wemhoener, Lehmkuhlenweg 30, D-49 Herford, Germany

Filed Sept. 13, 1974, Ser. No. 505,911

Int. Cl.² B32B *31/00*; B30B *15/34*, *1/00*

U.S. Cl. 156—583 **11 Claims**



1. A multiple piston-press for applying a resin coating material to workpieces of variable thicknesses having large surface areas, comprising:

a pressure frame;

at least two pressure plates, an upper plate and a lower plate, said plates mounted horizontally superimposed and normally spaced from each other in said pressure frame, to form a gap between them for accomodation of a workpiece;

means to heat the pressure plates;

means to introduce a workpiece into the said gap;

means to apply an adhesive resin- coating material to said workpiece;

said upper plate having a weight sufficient to compress it with said workpiece and said lower plate;

means to cause a free fall of the upper plate after introduction of the workpieces into said gap.

3,956,059

METHOD OF REDUCING MOISTURE CONTENT OF PARTICULATE SLURRIES

Carl W. Garbe, San Carlos, Calif., assignor to Dames & Moore, San Francisco, Calif.

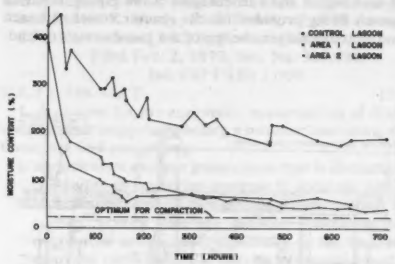
Filed Feb. 22, 1974, Ser. No. 444,633

Int. Cl.² B01D *1/00*; E02B *3/00*

U.S. Cl. 159—47 WL **4 Claims**

1. A process of evaporating water from a soil-water slurry comprising the steps of selecting a slurry having particulate solids having a density greater than water, at least some of said particulate solids having a size sufficient to pass a 200 mesh screen; depositing said slurry in a container with the surface of the slurry exposed to the atmosphere; and periodically

agitating said slurry at at least the air slurry interface to prevent the formation of a solid film between the atmosphere and



said slurry to produce accelerated evaporation to the atmosphere of water in said slurry.

3,956,060

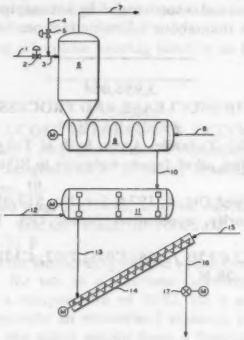
REMOVAL OF REACTION DILUENT FROM POLY(ARYLENE SULFIDE) REACTION SLURRY

Jack S. Scoggin, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 214,036, Dec. 30, 1971, abandoned. This application May 3, 1974, Ser. No. 466,662

Int. Cl.² B01D *1/00*

U.S. Cl. 159—47 R **8 Claims**



1. An improved process for recovering a free flowing, lump free granular polymer substantially free of polar organic diluent and other impurities from polymer reaction slurries under conditions which substantially minimize or avoid the "pasty" physical characteristics normally encountered in separating the diluent and polymer, which comprises the steps of:

a. producing a reaction effluent comprising a slurry of particulate poly(arylene sulfide), polar organic diluent, alkali metal halide (salt) and other impurities, which slurry is at a temperature in the range of 450° to 600°F and at a pressure in the range of 50 to 250 psig,

b. reducing the pressure of said slurry to atmospheric by passing same through a pressure reducing mechanism in a transfer line leading to a flash zone,

c. passing superheated steam which is at about the pressure of said slurry before pressure reduction of the slurry, through a pressure reducing mechanism which reduces the pressure thereof to atmospheric and then introducing the superheated steam into said transfer line at the point of pressure reduction and initial mixing of said slurry with said superheated steam,

d. passing the resulting mixed stream of reaction slurry and superheated steam through said transfer line and introducing same to a flash zone wherein said mixed stream is separated into water vapor and vaporized polar organic diluent which flashes overhead and is removed from said flash zone and a bottoms slurry residue comprising particulate poly(arylene sulfide), alkali metal halide and other impurities from which about 75 to 98 percent of the polar organic diluent has been flashed,

e. treating the flashed slurry residue substantially reduced in polar organic diluent content in at least one additional step to substantially remove residual polar organic diluent therefrom by subjecting the flashed slurry residue to agitation and countercurrent contact with steam heated to a temperature above the vaporization point of the polar organic diluent to form a vapor stream of said steam containing polar organic diluent vaporized from said flashed slurry residue which vapor stream is directed into said flash zone and removed with said vaporized polar organic diluent flashed overhead in step (d), and

f. recovering the flashed slurry residue comprising poly(arylene sulfide) and alkali metal halide substantially depleted of polar organic diluent from step (d) and subjecting same to water washing and filtering to remove alkali metal halide therefrom leaving particulate polymer substantially free of impurities as a product of the process.

3,956,061

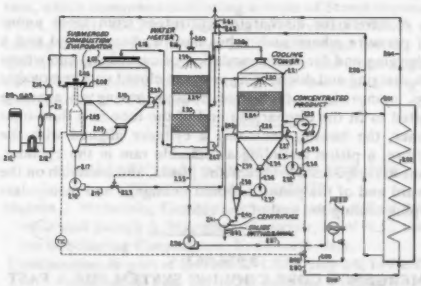
MULTI-STAGE PROCESSING AND CONCENTRATION OF SOLUTIONS

Walter L. Young; C. J. Douglas; Carl A. Connally, and Robert L. Cheek, all of Tulsa, Okla., assignors to Ozark-Mahoning Company, Tulsa, Okla.

Filed Feb. 19, 1974, Ser. No. 443,339

Int. Cl.² B01D *1/16, 1/14, 1/00*

U.S. Cl. 159—48 L **2 Claims**



1. A process of concentrating a solution comprising the steps of:

continuously heating a liquid body of the solution to be concentrated in a first vessel to drive off water vapor therefrom and maintain the said body at a high temperature in a first heating step;

passing the overhead vapor from said first vessel to a counterflow gas-vapor-liquid direct heat exchange water heater as at least part of the heating medium thereto;

passing the concentrated hot liquid bottoms from said first vessel as the overhead liquid input to a counterflow direct heat exchange cooling tower in gas-liquid contact with ambient air for further concentration thereof;

withdrawing concentrated liquid bottoms from the cooling tower and passing a portion thereof out of the system as concentrated product;

passing the gas-vapor overhead from the cooling tower to said counterflow water heater as another part of the heat exchanging medium thereto;

continuously joining a continuous stream of new solution to be concentrated with the remaining of the concentrated

liquid bottoms withdrawn from the cooling tower into a combined flow thereof,

thereafter passing said combined flow in indirect liquid-liquid heat exchanging relationship with the liquid bottoms from the water heater prior to passing said combined flow to said first heating step to be concentrated therein,

passing said combined flow after heat exchange with said water heater bottoms as a continuous feed to said first heating step to replace liquid evaporated therefrom, and

passing said heat exchanged liquid bottoms to the overhead liquid input of the water heater as feed thereto.

3,956,062

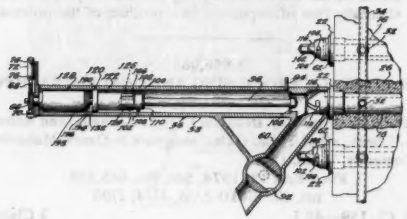
CONTINUOUS PILE DISCHARGING MACHINE

Phillips P. Smith, Richland, Wash., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed May 11, 1976, Ser. No. 212,035

Int. Cl.² G21C *19/20*

U.S. Cl. 176—30 **7 Claims**



1. A device for discharging cartridges from tubes under fluid pressure where such tubes have a charging end and a discharging end for accommodation of cartridges, and where such charging and discharging ends are closed with removable plugs, comprising a fluid-tight housing having an aperture adapted to fit the discharging end of the tube in a fluid-tight manner, the housing including a cylinder aligned with the aperture, a piston including a rotatable ram in the cylinder, means to reciprocate said ram and piston, and a wrench on the forward end of the piston adapted to engage and manipulate the plug sealing the end of the tube.

3,956,063

EMERGENCY CORE COOLING SYSTEM FOR A FAST REACTOR

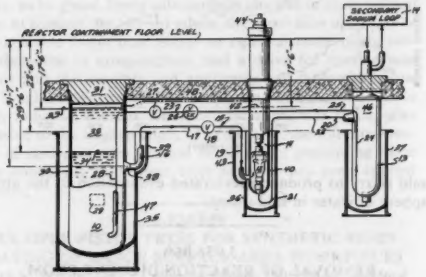
Harry G. Johnson, Richland, and Ronald N. Madsen, Pasco, both of Wash., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Continuation of Ser. No. 147,941, May 28, 1971, abandoned. This application May 24, 1973, Ser. No. 363,697

Int. Cl.² G21C *15/18*

U.S. Cl. 176—38 **4 Claims**

1. In a liquid-metal-cooled nuclear reactor incorporating a core disposed within a reactor vessel and including a primary heat transport system for the reactor consisting of a plurality of primary coolant loops each including a pump and a heat exchanger, said reactor vessel, pumps, and heat exchangers being connected by piping including horizontal and vertical coolant runs, the inlet lines for the reactor communicating with the interior of the reactor vessel below the core and the pump suction lines communicating with the interior of the reactor vessel above the core, said reactor vessel containing liquid metal coolant to at least a predetermined arbitrary minimum safe reactor vessel coolant level above the top of the reactor outlet lines, and means for operating the pumps at a predetermined normal operating total dynamic head and pony motors for operating the pumps at a predetermined lower total dynamic head at emergence speed, the improvement comprising guard vessels surrounding the reactor vessel, the pumps, the heat exchangers and vertical runs of the piping, separate guard vessels being provided for the reactor vessel and each pump and heat exchanger, the top of the guard vessels extending above said minimum safe reactor vessel coolant level by a distance at least equal to the total dynamic head of the pumps at emergency speed, all horizontal runs of the piping being elevated above the top of the guard vessels and wherein the verticle portion of the reactor inlet line disposed within the reactor guard vessel is surrounded by a standpipe having a free volume of less than about 1.5 cubic feet per foot of height.



3,956,064

DEOXYRIBONUCLEASE AND PROCESS FOR ITS PREPARATION

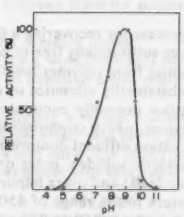
Koki Horikoshi; Tadahiko Ando, both of Tokyo, and Koichi Yoshida, Hino, all of Japan, assignors to Rikagaku Kenkyusho, Japan

Filed Oct. 4, 1974, Ser. No. 512,058

Claims priority, application Japan, Oct. 11, 1973, 48-114131

Int. Cl.² C12D *13/06*; C07G *7/02*; C12D *13/10*

U.S. Cl. 195—28 N **5 Claims**



3. Deoxyribonuclease capable of selectively cleaving the phosphodiester bond between deoxyguanosin and deoxyguanosin in a molecule of deoxyribonucleic acid while the phosphate group remains attached to deoxyguanosin in the 5′ position of deoxyribose, said deoxyribonuclease being obtained by cultivating a strain of the new Species M-29 of Genus Bacillus in an alkaline culture medium containing at least one metal carbonate under aerobic conditions followed by separation from the fermentation liquid.

3,956,065

INERT, NON-POROUS GRANULES FOR FLOW CONTROL IN A PLUG FLOW REACTOR

Leo R. Idaszak, Palos Heights; Richard A. Terranova, Argo, and Robert E. Heady, Park Forest, all of Ill., assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed Feb. 2, 1973, Ser. No. 328,996
Int. Cl.² C12D *13/00*
U.S. Cl. 195—31 F **13 Claims**

1. A process for the enzymatic isomerization of dextrose to levulose that comprises passing a solution containing dextrose through a bed comprising:

a. a particulate enzyme preparation that is characterized by the ability to isomerize dextrose to levulose; and

b. substantially inert, non-porous beads having a lower specific gravity than the solution containing dextrose, distributed substantially uniformly in the bed, to space apart the particles of the enzyme preparation and exert a buoyant action and to establish the flow pattern in the bed.

13. A process for the enzymatic isomerization of dextrose to levulose comprising the steps of;

a. passing a solution containing dextrose at a pH in the range of about 6 to about 9, and a temperature in the range of about 50°C to about 80°C, through a bed in a confined reaction zone, said bed comprising:

i. a dextrose isomerase that is immobilized on DEAE cellulose, and

ii. non-porous polystyrene beads that have a lower specific gravity than said solution containing dextrose, said beads being generally spherical and having a mesh size in the range −18 +50, U.S. Standard Sieve, to space apart the immobilized dextrose isomerase and to establish the flow pattern in the bed; and

b. recovering a levulose bearing solution as the effluent.

3,956,066

GLUCOSE ISOMERIZING ENZYME

Lowell E. Coker, Crete, and Donald E. Gardner, Hazel Crest, both of Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Aug. 16, 1973, Ser. No. 389,054
Int. Cl.² C12D *13/10, 13/02*
U.S. Cl. 195—31 F **35 Claims**

1. A process for isomerizing hexose with a heat-stable isomerase suitable for use in a dextrose isomerization process conducted at a temperature of 70°C. for a period of time sufficient to provide an isomerized aqueous solution which contains on a dry solids weight basis a fructose to dextrose weight ratio of at least about 1 to 4, said process comprising the steps of:

a. providing an aqueous solution containing at least one hexose selected from the group consisting of dextrose and fructose;

b. subjecting the aqueous solution to a glucose isomerase obtained from a microorganism selected from the group of *Flavobacterium devorans* NRRL B-5384, *Flavobacterium devorans* ATCC 10829, *Brevibacterium incertum* NRRL B-5383; and *Streptomyces phaeochromogenes* ATCC 15486; and

c. maintaining the aqueous solution under isomerizing conditions sufficient to provide an isomerized hexose.

18. A process of producing glucose isomerase by cultivating an organism selected from the group consisting of *Flavobacterium devorans* NRRL B-5384, *Flavobacterium devorans* ATCC 10829, *Brevibacterium incertum* NRRL B-5383; and *Streptomyces phaeochromogenes* ATCC 15486 under conditions and for a length of time sufficient to produce at least 15 units glucose isomerase having a temperature optimum of at least about 65°C. as determined by the amount of fructose produced from dextrose in 1 hour.

27. A heat-stable, isomerase suitable for use in a dextrose isomerization process conducted at temperatures of at least 70°C. for a period of time sufficient to provide an isomerized aqueous solution which contains on a dry solids weight basis a fructose to dextrose weight ratio of at least about 1:4 said isomerase characterized as possessing an isomerase activity of greater than 750 units per gram of dry substance, an optimum isomerase activity temperature of greater than 65°C., and the isomerase is derived from at least one organism selected from the group consisting of *Flavobacterium devorans* NRRL B-5384, *Flavobacterium devorans* ATCC 10829, *Brevibacterium incertum* NRRL B-5383, and *Streptomyces phaeochromogenes* ATCC 15486.

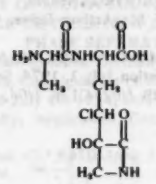
3,956,067

ANTIBIOTIC X-372A

James P. Scannell; David L. Pruess, both of North Caldwell, and Thomas C. Demny, Livingston, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 504,936, Sept. 11, 1974, Pat. No. 3,901,880. This application May 28, 1975, Ser. No. 581,453
Int. Cl.² C12D *9/00*
U.S. Cl. 195—80 R **1 Claim**

1. A process for the production of an antibiotic substance of the formula:



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wherein all of the optically active sites are in the S configuration, which comprises cultivating a strain of Streptomyces Sp. 372A, NRRL 8045 in an aqueous carbohydrate solution containing a nitrogenous nutrient under submerged aerobic conditions until activity versus gram-positive and gram-negative bacteria is imparted to said solution and then recovering said antibiotic of the Formula I from said solution.

3,956,068

ANTIBIOTIC G-52 AND METHOD FOR THE PRODUCTION THEREOF

Marvin J. Weinstein; Gerald H. Wagman, both of East Brunswick, and Joseph A. Marquez, Montclair, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 271,838, July 14, 1972. This application Feb. 28, 1975, Ser. No. 554,046
Int. Cl.² C12D *9/20*
U.S. Cl. 195—96 **5 Claims**

1. A process which comprises cultivating Micromonospora zionensis including mutants and variants thereof having the identifying characteristics of NRRL 5466 in an aqueous medium containing assimilable sources of nutrient materials under aerobic conditions until a complex consisting of antibiotic G-52 and sisomicin is produced and isolating the complex from the medium.

3,956,069

ENZYMATIC ASSAYS FOR GLUCOSE, CREATINE PHOSPHOKINASE OR PLASMA AMMONIA

Charles C. Allain, Los Angeles, and Carl P. Henson, Alhambra, both of Calif., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Apr. 29, 1974, Ser. No. 465,039
Int. Cl.² G01N *31/14*; C07G *7/02*
U.S. Cl. 195—103.5 R **9 Claims**

1. In an enzymatic assay of a sample for measurement of glucose, creatine phosphokinase, and plasma ammonia wherein nicotinamide adenine dinucleotide is reduced or the

reduced form of nicotinamide adenine dinucleotide is oxidized to nicotinamide adenine dinucleotide, said reduced form or disappearance of said reduced form of nicotinamide adenine dinucleotide being a quantitative measure of the constituent in said sample which is being measured and being subject to reaction with pyruvate in the presence of lactic dehydrogenase to thereby cause errors in said assay, the improvement comprising:

conducting said assay in the presence of a compound selected from the class consisting of oxalic acid and oxamic acid or salts thereof, the concentration of said compound ranging from about 2 to 50 micromoles per liter of reagent solution and being sufficient to inhibit the reaction of lactic dehydrogenase while at the same time not interfering with the constituents being measured, whereby said compound forms an inactive complex with lactic dehydrogenase to thereby eliminate interference and minimize any errors in said assay.

3,956,070

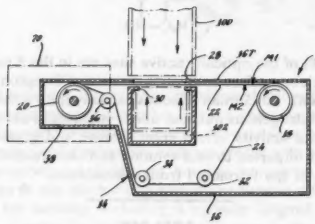
BACTERIA SCREENING DEVICE FOR CONTINUOUSLY MONITORING AND RECORDING THE EXISTENCE OF AIR BORNE BACTERIA AND OTHER MICROORGANISMS

Charles L. Kenyon, 15 MacArthur Drive, Old Greenwich, Conn. 06870

Continuation-in-part of Ser. No. 246,264, April 21, 1972, abandoned. This application July 1, 1974, Ser. No. 484,993

Int. Cl.² C12B *1/02*; C12K *1/04*, *1/06*

U.S. Cl. 195—103.5 R **18 Claims**



1. A bacteria screening device for detecting and recording the existence of bacteria or other microorganisms suspended in gaseous media, comprising:

housing means;

inlet means in said housing means for receiving a flow of the gaseous medium;

a removable cartridge containing a strip mounted on supply and take up reels and carrying a wet activated culture medium on an exposable surface thereof;

said cartridge having an exposure window such that when the cartridge is positioned in the housing means it directly exposes a limited portion of the culture medium thereon to the flow of the gaseous medium received by the inlet means so as to contact bacteria or other microorganisms suspended in the gaseous medium with said limited portion of the culture medium;

means for conveying the strip between said reels to advance other portions of the culture medium into position for exposure to gaseous media received in said inlet means;

a sterile separating strip for preventing contact of the exposed culture strip when the strip is wound on the take up reel; and

means within said housing and separate from said cartridge for heating and incubating the exposed limited portions of the culture medium in said cartridge to detect and record the existence of bacteria or other microorganisms in the gaseous medium.

14. A bacteria screening method for detecting and recording the existence of bacteria and other microorganisms suspended in gaseous media, comprising:

mounting a strip carrying a wet activated culture medium on an exposable surface thereof on supply and take up reels;

causing a flow of said gaseous mediun to impinge on said strip to directly inoculate a limited portion of the culture medium thereon with the bacteria and other microorganisms in said gaseous medium;

conveying the strip between said supply and take up reels to advance each such limited portions of the wet activated culture medium into position for exposure to the flow of gaseous medium at a predetermined rate so that the position on said strip of an inoculated culture discloses the time of such exposure; and

incubating the exposed limited portions of the culture medium to detect and record the existence of bacteria or other microorganisms in the gaseous medium at any position on said tape.

3,956,071

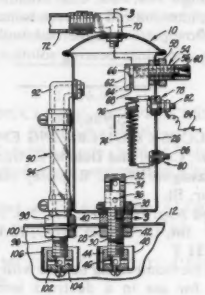
ELECTRICAL HEATING APPARATUS FOR REMOVING VAPORIZABLE IMPURITIES FROM LUBRICATING OIL

Edward M. O'Brien, 1717 E. St. Louis Ave., Las Vegas, Nev. 89105

Filed Aug. 19, 1974, Ser. No. 498,441

Int. Cl.² C10C *1/20*; C10G *31/02*; F01M *1/10*

U.S. Cl. 196—46 **1 Claim**



1. In an apparatus for removing vaporizable impurities from lubricating oil the combination of:

a. a housing having a top and a bottom;

b. oil inlet fitting means connected to and communicating with the interior of said housing in a location closer to the top of said housing than the bottom thereof;

c. said inlet fitting means having a downwardly directed, intermediate inlet port, and laterally and downwardly directed side inlet ports on opposite sides of said intermediate port, said ports located within the interior of said housing;

d. said inlet fitting means having an external groove interconnecting said side and intermediate ports;

e. an electrical heating element mounted in said housing below said intermediate port;

f. said heating element having the form of a conical spiral positioned below said intermediate port with the larger end of said conical spiral uppermost;

g. a ball seated in and supported by the upper end of said conical spiral in a position to have impinged thereon oil discharged by at least said intermediate port;

h. a vent for vaporized impurities connected to and communicating with the interior of said housing in a location at the top thereof; and

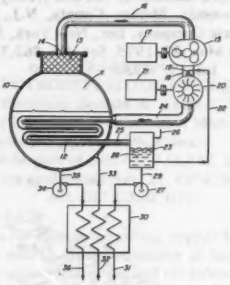
i. oil outlet fitting means connected to and communicating with the interior of said housing at a location closer to the bottom of said housing than the top thereof, and below said inlet fitting means, said conical spiral, and said ball.

3,956,072

VAPOR DISTILLATION APPARATUS WITH TWO DISPARATE COMPRESSORS

Henry Huse, Darien, Conn., assignor to Atlantic Fluidics, Inc., Stamford, Conn.

Filed Aug. 21, 1975, Ser. No. 606,521
Int. Cl.² B01D 1/28
U.S. Cl. 202—177 **8 Claims**



1. A vapor compression system including in combination an evaporator vessel, heat exchange tube within said vessel, first and second ends of said heat exchange tube, a rotary positive displacement compressor, an outlet of said vessel, first conduit means communicating said outlet with said rotary compressor, a liquid ring compressor, interstage conduit means communicating said rotary compressor with said ring compressor, second conduit means communicating said ring compressor with said first end of said heat exchange tube, a distillate receiving vessel, and third conduit means communicating said second end of said heat exchange tube with said distillate receiving vessel.

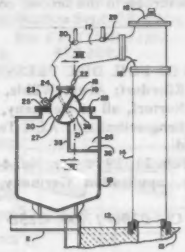
3,956,073

COKE OVEN GAS AND LIQUOR COLLECTING APPARATUS

Walter E. Carbone, Summit, and Paul V. Faber, Morristown, both of N.J., assignors to Wilputte Corporation, Murray Hill, N.J.

Continuation-in-part of Ser. No. 392,873, Aug. 30, 1973, abandoned. This application Feb. 18, 1975, Ser. No. 550,266
Int. Cl.² C10B 27/06
U.S. Cl. 202—254 **4 Claims**

1. In a by-product coke oven battery comprising a plurality of coke ovens, a standpipe opening out of the top of each oven, a coking gas collecting main and a charging gas collecting main, the improvement comprising a cylindrical valve body disposed with its axis horizontal, an inlet port in the upper circumferential surface of the valve body positioned above a diameter thereof, connected to the standpipe, two outlet ports separated from each other in the lower circumferential surface of the valve body, below the aforesaid diameter thereof, one connected to the coking gas collecting main and the other to the charging gas collecting main, a vane within the valve body adapted to rotate about the valve body axis from a position connecting the inlet port with one outlet port, through an intermediate position closing off the inlet port from both outlet ports, to a position connecting the inlet port with the other outlet port, and an overflow conduit opening out of the valve body above the aforesaid diameter thereof



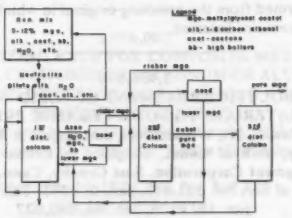
and discharging into one of the collecting mains, positioned to maintain a liquor seal in the valve in its intermediate position.

3,956,074

RECOVERY OF METHYLGLYOXAL ACETAL BY PLURAL STAGE DISTILLATION WITH INTERMEDIATE PHASE SEPARATION

Knut Bittler, Ludwigshafen, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed July 10, 1974, Ser. No. 487,235
Claims priority, application Germany, July 31, 1973, 2338665
Int. Cl.² B01D 3/00, 3/10, 3/38
U.S. Cl. 203—76 **12 Claims**



1. A process for the recovery of methylglyoxal acetal from a reaction mixture containing 5–12% by weight of methylglyoxal acetal which has been obtained by a synthesis reaction by the oxidation of acetone in the presence of an alkanol having up to six carbon atoms in mixture with an acid catalyst, followed by neutralization of the reaction mixture, which comprises

a. diluting the neutralized reaction mixture containing 5–12% water to form a homogeneous solution;
b. distilling the diluted reaction mixture in a first column where a mixture of acetone, and said alkanol is taken overhead and returned to the synthesis stage while an azeotrope of methylglyoxal acetal, water and high-boilers is withdrawn as a side stream, the bottoms being discarded;
c. condensing said azeotrope;
d. forming in the condensed azeotrope an upper phase which is richer in methylglyoxal acetal and a lower phase which is lower in methylglyoxal acetal, and returning the lower phase to the first column;
e. distilling said upper phase in a second column, the bottoms being returned to the first column, the overhead being condensed and separated into an upper phase which is richer in methylglyoxal acetal and which is returned to the second column while the lower phase is returned to the first column, and substantially purified

methylglyoxal acetal being withdrawn as a side stream which is

f. introduced into a third distillation column from which pure methylglyoxal acetal is withdrawn overhead and the bottoms are returned to the second column.

3,956,075

FABRICATION OF FOIL DISC PRESSING MATRICES

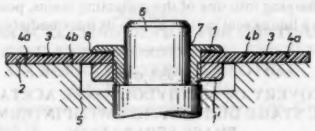
Werner Rohwer, Ellerdorf; Alwin Wühle, and Klaus Röschmann, both of Nortorf, all of Germany, assignors to TED Bildplatten Aktiengesellschaft, AEG-Telefunken, Teldec, Zug, Switzerland

Filed Feb. 21, 1974, Ser. No. 444,345

Claims priority, application Germany, Feb. 23, 1973, 2308891

Int. Cl.² B29D *17/00*; C25D *1/00*

U.S. Cl. 204—5 5 Claims



1. In the fabrication of a matrix by galvanic reproduction from a lacquer foil original in which a centering core is inserted, which matrix is to be employed for pressing foil disc copies, a method comprising: cutting the surface of a lacquer foil member to form first grooves corresponding to the grooves to be traced on the resulting copy by a playback stylus and additional grooves which are deeper than the first grooves and which have a form such as to produce cutting edges on a matrix formed from the resulting original in which the centering core remains inserted.

3,956,076

PYROLYTIC TREATMENT OF SOLID WASTE MATERIALS TO FORM CERAMIC PRILLS

Orlo A. Powell, Jr., Wethersfield, and Angelo J. Roncari, East Granby, both of Conn., assignors to Urban Research & Development Corporation, East Granby, Conn.

Division of Ser. No. 321,449, Jan. 5, 1973. This application Jan. 16, 1975, Ser. No. 542,027

Int. Cl.² B22D *23/08*

U.S. Cl. 264—14 10 Claims

1. In a method for disposing of and converting solid waste material, the steps comprising:

A. providing a substantially vertical pyrolysis chamber;

B. charging solid waste material having organic and inorganic components into the upper region of said pyrolysis chamber, said solid waste material containing as minimum weight values, about 2.0 percent of glass and ceramics, 18.0 percent of paper products, 3.0 percent of metals and 6.0 percent of food waste and other organic materials;

C. charging under pressure an oxygen-rich gas into said chamber at a plurality of vertically spaced points along the length thereof so as to produce combustion of said organic components and generate heat while controlling the charging of said oxygen-rich gas at said plurality of points to maintain a plurality of different and downwardly increasing temperature zones adjacent said plurality of vertically spaced points along the length of said chamber so as to effect incomplete combustion of said organic component and form a conbustible gas in the upper zones and to melt and oxidize the inorganic components of said waste material into an organic-free molten refractory material in the lowermost zone, the temperature of said molten refractory material at the lower region of said pyrolysis chamber being at least about 1075° Centrigrade;

D. removing said combustible gas from said upper region of said pyrolysis chamber and said molten refractory material from said lower region thereof; and

E. prilling said removed molten refractory material to form ceramic prills.

7. The method of claim 1 wherein said molten refractory material is prilled by discharging droplets of said molten refractory material downwardly through a counter current stream of gas onto a relatively cool bed of flowing liquid.

3,956,077

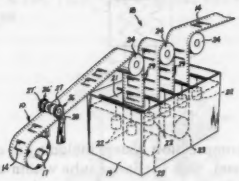
METHODS OF PROVIDING CONTACT BETWEEN TWO MEMBERS NORMALLY SEPARABLE BY AN INTERVENING MEMBER

John T. Hamby, Jr., Richmond, Va., and Wesley P. Townsend, Princeton Township, Mercer County, N.J., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Mar. 27, 1975, Ser. No. 562,733

Int. Cl.² C25D *5/02*, *7/00*

U.S. Cl. 204—15 10 Claims



1. A method of providing contact between two members having interfacing surface portions normally separable by an intervening element located between other surface portions of the two members, which comprises the steps of:

forming protrusions in the interfacing surface portions of at least one of the two members to a height sufficient to permit the protrusions to contact the interfacing surface portions of the other of the two members notwithstanding the presence of the intervening element between other surface portions of the two members, and

moving the two members proximate to each other, separated by the intervening element, to permit the protrusions formed in the one member to contact the interfacing surface portions of the other member.

3,956,078

ELECTRODEPOSITION OF COPPER

Otto Kardos, Ferndale; Donald A. Arcilesi, Mount Clemens, and Silvester P. Valayil, Pontiac, all of Mich., assignors to M & T Chemicals Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 315,112, Dec. 14, 1972, abandoned. This application Nov. 21, 1974, Ser. No. 525,713

Int. Cl.² C25D *3/38*

U.S. Cl. 204—52 R 32 Claims

1. A process for electrodepositing copper from an aqueous acidic copper plating bath containing at least one member independently selected from each of the following two groups:

A. 0.005 gram per liter to 40 grame per liter of an aryl, aralkyl or cycloaliphatic amine exhibiting the formula:

wherein X, Y, and Z are each independently selected from the group consisting of hydrogen, substituted and unsubstituted benzyl, phenyl, and cyclohexyl rings; $-CH_2R$, $-CH_2RSO_3$, $-CH_2ROH$ where R is a substituted or unsubstituted alkyl chain of one or two carbon atoms provided that at least one member of X, Y, and Z is benzyl, phenyl, or cyclohexyl; and

B. sulfoalkyl sulfide compounds containing the grouping —Alk—SO_3M where M is one gramequivalent of a cation and —Alk— is a divalent aliphatic hydrocarbon group of 1 to 8 carbon atoms in an amount of 0.01 milligrams per liter to 1000 milligrams per liter.

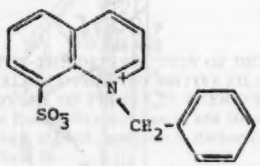
3,956,079
ELECTRODEPOSITION OF COPPER

Otto Kardos, Ferndale; Donald A. Arcilesi, Mount Clemens, and Silvester P. Valayil, Pontiac, all of Mich., assignors to M & T Chemicals Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 315,112, Dec. 14, 1972, abandoned. This application Nov. 21, 1974, Ser. No. 525,718
Int. Cl.² C25D *3/38*
U.S. Cl. 204—52 R **6 Claims**

1. A process for electrodepositing copper from an aqueous acidic copper plating bath containing at least one member independently selected from each of the following two groups:

A. 0.005 to 40 grams per liter of an aryl amine exhibiting the formula:



B. sulfoalkyl sulfide compounds containing the grouping —S—Alk—SO_3M where M is one gram-equivalent of a cation and -Alk- is a divalent aliphatic hydrocarbon group of 1 to 8 carbon atoms in an amount of 0.01 milligrams per liter to 1000 milligrams per liter.

3,956,080
COATED VALVE METAL ARTICLE FORMED BY SPARK ANODIZING

Rudolf J. Hradcovsky, Long Beach, and S. Heagan Bayles, Jr., Sands Point, both of N.Y., assignors to D & M Technologies, New York, N.Y.

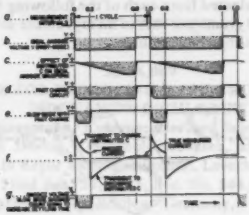
Division of Ser. No. 337,149, March 1, 1973, Pat. No. 3,832,293. This application Aug. 22, 1974, Ser. No. 499,638
Int. Cl.² C25D *11/04, 11/30, 11/26*
U.S. Cl. 204—56 R **5 Claims**

1. An article comprising a rectifier metal having a non-porous, fused silicate coating on at least one surface of the metal, the coating being produced by immersing the rectifier metal in a strongly alkaline aqueous bath comprising at least one alkali metal silicate, an alkali metal hydroxide, and as a catalyst, an oxyacid of tellurium or selenium or a mixture of such oxyacids and establishing a potential difference of at least about 220 volts between the metal and the bath to deposit a silicate-containing coating on the immersed surface of the metal.

3,956,081
METHOD OF HIGH SPEED RESISTOR TRIMMING

Malcolm C. Holtje, Concord, Mass., assignor to General Radio, Concord, Mass.

Division of Ser. No. 349,061, April 9, 1973, Pat. No. 3,855,109. This application Sept. 23, 1974, Ser. No. 508,668
Int. Cl.² C25D *11/02*
U.S. Cl. 204—56 R **5 Claims**



1. A method of trim-anodizing a thin-film resistor to a predetermined value, that comprises the sequential steps of applying anodizing current to said resistor during an anodizing period, removing said current and providing a settling period, and then determining whether said resistor is greater or less than the predetermined value, said sequential steps being repeated in a cyclic manner with each cycle being principally anodizing and to a minor extent settling and determining; and, when said resistor value approaches said predetermined value, automatically modifying such cycle to increase the settling period during the cycle.

3,956,082
ANODIZING BATH FOR COMPOSITE METAL MATERIAL COMPOSED OF ALUMINUM OR ALUMINUM ALLOY AND DIFFERENT METAL HAVING A LOWER IONIZATION TENDENCY

Chozo Yoshimura, Nara, and Michiaki Hirochi, Osaka, both of Japan, assignors to Kabushiki Kaisha Shokosha, Osaka, Japan

Filed Oct. 24, 1974, Ser. No. 517,647
Int. Cl.² C25D *11/06*
U.S. Cl. 204—58 **2 Claims**

1. An electrolyte for anoidizing a composite metal material composed of aluminum or aluminum alloy and different metal having a lower ionization tendency than said aluminum or aluminum alloy, said bath consisting essentially of 0.1 to 4.0M aqueous solution of caustic soda having added thereto 0.3 to 12% by volume of hydrogen peroxide.

3,956,083
ELECTROCHEMICAL ANODE AND PROCESS USING THE ANODE

Edward H. Cook, Jr., Lewiston, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 494,110, Aug. 2, 1974, Pat. No. 3,882,002. This application May 5, 1975, Ser. No. 574,806
Int. Cl.² C25B *1/26, 1/16, 11/10*
U.S. Cl. 204—95 **9 Claims**

7. In a method of electrolyzing aqueous alkali metal chloride solutions in an electrolytic cell comprising an anode and a cathode wherein chlorine and an alkali metal hydroxide are formed, the improvement which comprises using as the anode, a composite structure comprising a valve metal substrate, a coating thereon of conductive tin oxide containing a doping amount of tellurium and an outer coating on the surface of the conductive tin oxide, of at least one of a noble metal or noble metal oxide.

3,956,084

ELECTRODEPOSITION OF COPPER

Otto Kardos, Ferndale; Donald A. Arcilesi, Mount Clemens, and Silvester P. Valayil, Pontiac, all of Mich., assignors to M & T Chemicals Inc., Greenwich, Conn.

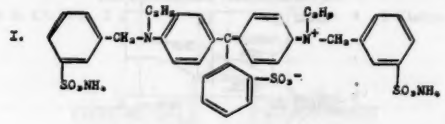
Continuation-in-part of Ser. No. 315,112, Dec. 14, 1972, abandoned. This application Nov. 21, 1974, Ser. No. 525,715

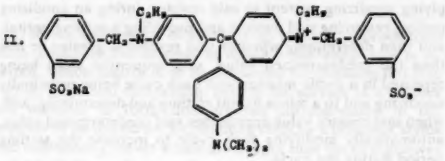
Int. Cl.[2] C25D *3/38*

U.S. Cl. 204—52 R 6 Claims

1. A process for electrodepositing copper from an aqueous acidic copper plating bath containing at least one member independently selected from each of the following two groups:

A. 0.005 to 40 grams per liter of an aryl amine selected from those exhibiting the formulae:





and

B. sulfoalkyl sulfide compounds containing the grouping —S—Alk—SO_3M where M is one gram - equivalent of a cation and —Alk— is a divalent aliphatic hydrocarbon group of 1 to 8 carbon atoms in an amount of 0.01 milligrams per liter to 1000 milligrams per liter.

3,956,085

METHOD FOR THE MANUFACTURE OF A TOOL-SET FOR THE FORMING OF SHEET METAL OBJECTS

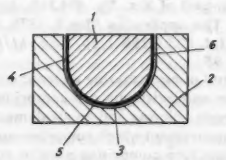
Eberhard Haas, Beethovenstr. 11, 7104 Obersulm II, Germany

Filed Dec. 6, 1973, Ser. No. 422,592

Claims priority, application Germany, Dec. 6, 1972, 2259719

Int. Cl.[2] C25F *3/06, 7/00*

U.S. Cl. 204—129.35 3 Claims



1. A method for the manufacture of a tool-set for sheet-metal forming comprising a punch part and a die part, which comprises preshaping the punch part to its true shape and preshaping the die part approximately to its true shape corresponding to the shape of the punch part, electroplating the shaping surface of the punch part with a layer of electrically conductive material to a depth which corresponds to the difference between the metal sheet which is to formed by the tool and the width of the spark gap which exists during erosion, subjecting the die part to spark erosion utilizing the corresponding punch part as the electrode, and removing the layer of electrically conductive material from the surface of the punch part.

3,956,086

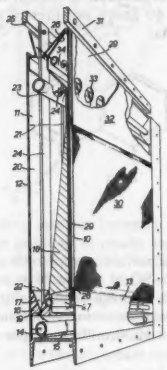
ELECTROLYTIC CELLS

John Arthur Elton Wilkinson, Fareham; Robert Semple Everett Leslie, Havant; David Michael Glindon, Petersfield; Kendrick Peter Haines, Havant, and Keith Baker, Portsmouth, all of England, assignors to CJB Development Limited, London, England

Filed May 17, 1974, Ser. No. 471,144

Int. Cl.[2] C25C *1/00, 1/12, 7/02*

U.S. Cl. 204—105 R 5 Claims



1. A process for the electrodeposition of metal onto the particles of a fluidized bed cathode and within an electroactive region of a cathode compartment of an electrolytic cell, which process comprises the steps of:

forming said cathode compartment such that within the electroactive region of said cathode compartment all internal angles between structural surfaces are greater than 90° and are radiused to a radius greater than those of the particles and such that within said electroactive region there are no surfaces of substantially horizontal disposition except horizontal surfaces over which said flow of electrolyte is such as to displace the particles adjacent said surfaces;

charging a plurality of metallic particles into said cathode compartment of said electrolytic cell;

flowing upwardly through said plurality of metallic particles an aqueous liquid electrolyte to fluidize said plurality of said metallic particles and form a fluidized bed cathode, said flowing being at a rate sufficient to maintain the volume occupied by the particles at a volume at least 10% greater than the volume they occupy when settled;

maintaining an electrical potential difference between said fluidized bed cathode and a counter electrode in said cell; and,

removing from the cathode compartment particles which by virtue of their large size tend to form particle bridges between structural surfaces in said cathode compartment.

3,956,087

ELECTROCHEMICAL MINING OF COPPER

William F. Drinkard, Jr., Charlotte, N.C., assignor to Mineral Research & Development Corporation, Charlotte, N.C.

Filed May 17, 1974, Ser. No. 470,810
Int. Cl.² C25C *1/12, 1/06, 1/24, 7/08*
U.S. Cl. 204—107 **10 Claims**

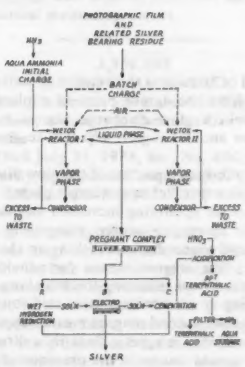
1. A method for the direct extraction of copper values from earth deposits of copper containing sulfide ores comprising attaching a positive source of direct current to a deposit of copper containing sulfide ore to form an anode, contacting said ore with a halogen salt containing electrolyte, positioning a cathode in said electrolyte, passing a decomposition voltage from said anode to said cathode to decompose said anode, said decomposition voltage being sufficient to deposit copper at the cathode but below that required for depositing iron, said electrolyte having a pH of less than about 5 and a halogen ion concentration of at least about one molar.

3,956,088

PROCESS FOR THE DESTRUCTION OF DEVELOPED AND UNDEVELOPED PHOTOSENSITIVE FILM AND THE RECOVERY OF PRODUCTS THEREFROM

Wayne Martin Fassell, Newport Beach, and Donald W. Bridges, Irvine, both of Calif., assignors to Barber-Colman Company, Rockford, Ill.

Filed May 1, 1974, Ser. No. 465,801
Int. Cl.² C22D *1/12*; C22B *11/04*
U.S. Cl. 204—109 **20 Claims**



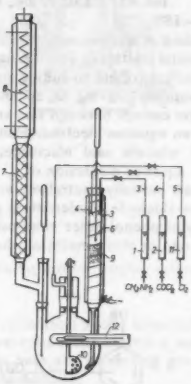
1. A process for the destruction of developed or undeveloped film having a silver emulsion coating comprising the steps of mixing the film with an aqueous medium containing an agent which forms a soluble complex with silver, subjecting the mixture to wet oxidation at elevated temperature and elevated pressure while introducing an oxygen containing gas under a high state of agitation for rapid distribution of the oxygen into the liquid mixture, continuing the wet oxidation reaction until the chemical oxygen demand COD of the organic material in the mixture is reduced and the silver and film material are converted to a soluble state within the resulting liquor, and treating the liquor to separate the silver.

3,956,089

PROCESS FOR PRODUCING N-CHLOROCARBONYL ISOCYANIDE DICHLORIDE

Hermann Hagemann, Cologne; Herbert Schwarz, Opladen, and Fritz Döring, Odenthal-Gloebusch, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 24, 1975, Ser. No. 544,021
Claims priority, application Germany, Feb. 2, 1974, 2405005
Int. Cl.² B01J *1/10*
U.S. Cl. 204—158 HA **5 Claims**



1. In a process for preparing N-chlorocarbonyl isocyanide dichloride by chlorinating methyl isocyanate and/or methyl carbamic acid chloride optionally in solution in the presence of ultraviolet light at elevated temperatures, the improvement comprising chlorinating at a temperature in the range of from 30° to 120°C and controlling the temperature pattern during the reaction in relation to the concentration of methyl isocyanate in the reaction mixture in such a manner that low temperatures are maintained for high concentrations while high temperatures are maintained with low concentrations.

3,956,090

HYDROCARBON UPGRADING PROCESS IN PARAFFIN OXIME PRODUCTION

Robert M. Suggitt, Wappingers Falls; Walter C. Gates, Jr., Newburgh, and Ralph B. Hudson, Jr., Beacon, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 428,508, Dec. 26, 1973. This application Dec. 13, 1974, Ser. No. 532,353
Int. Cl.² B01J *1/10*
U.S. Cl. 204—162 XN **12 Claims**

1. In a process for producing normal paraffin oximes from n-paraffin wherein a portion of said n-paraffin is photochemi-

cally reacted with a gaseous nitrosating agent to form a paraffin oxime, alkylchlorides and oxygenated by-products, wherein said oxime is separated from a mixture of unreacted paraffin, alkylchlorides and oxygenated by-products, the improvement which comprises:

a. catalytically hydrogenating said mixture at a temperature of from about 600° to 750°F. in the presence of a catalyst composed of alumina and a Group VIII metal and from about 10 to 5000 parts per million of nitrogen present as ammonia or an, organonitrogen compound basis said paraffin mixture; and

b. recycling said hydrogenated product of (a) for reaction with said n-paraffin to said oxime.

3,956,091

METHOD OF ELECTRODEPOSITING

Owen D. Stepp, Sarver, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

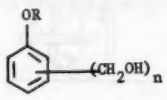
Filed May 16, 1974, Ser. No. 470,479
Int. Cl.² C25D *13/06, 13/14*
U.S. Cl. 204—181 **10 Claims**

1. In a method of electrocoating an electrically-conductive surface of a metal container which is used with food products which cause or contribute to sulfide staining, said surface of the metal container serving as an anode which comprises passing electric current between said anode and a cathode in contact with an aqueous electrodepositable composition, the improvement wherein said electrodepositable composition comprises an aqueous dispersion of:

A. an at least partially-neutralized acrylic interpolymer;

B. an amine-aldehyde condensation product; and

C. a methylol phenol ether composition consisting essentially of one or more methylol phenol ethers of the formula:



where *n* is an integer from 1 to 3 and R is an unsaturated aliphatic group or a halogen-substituted unsaturated aliphatic group.

3,956,092

METHOD OF MAKING MEASURING ELEMENTS SUCH AS GAUGE BLOCKS

Anders Kampe, Eskilstuna, and Olof Vingsbo, Uppsala, both of Sweden, assignors to Aktiebolaget C. E. Johansson, Eskilstuna, Sweden

Continuation-in-part of Ser. No. 224,588, Feb. 8, 1972, abandoned. This application May 2, 1974, Ser. No. 466,315
Claims priority, application Sweden, Feb. 19, 1971, 2133/71; Feb. 2, 1972, 1171/72
Int. Cl.² C23C *15/00;* **G01B** *3/30*
U.S. Cl. 204—192 **8 Claims**

1. A method for producing a scratch-resistant planar measuring surface on a steel combination gauge block comprising the steps of:

a. prelapping the measuring surface to provide a smooth and warp-free surface,

b. continuing the prelapping operation until the surface is about 2 to about 5 microns below the desired level of the intended measuring surface,

c. applying onto the prelapped surface, by a cathode sputtering process and with the temperature of the prelapped surface being maintained at less than 150° C, a cermet material layer of at least one carbide, nitride or boride of metals belonging to the groups numbered 3 to 6 in the Periodic Table, the cermet layer being applied with a thickness to produce a surface at least at the desired level.

4. A method for producing a scratch-resistant planar measuring surface on a steel combination gauge block comprising the steps of:

a. prelapping the measuring surface to provide a smooth and warp-free surface,

b. continuing the prelapping operation until the surface is about 2 to about 5 microns below the desired level of the intended measuring surface,

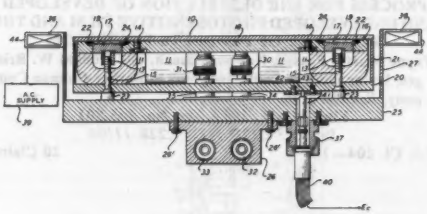
c. applying onto the prelapped surface, by a cathode sputtering process and with the temperature of the prelapped surface being maintained at less than 150°C, a ceramic material layer with a thickness to produce a surface at least at the desired level.

3,956,093

PLANAR MAGNETRON SPUTTERING METHOD AND APPARATUS

Paul S. McLeod, Berkeley, Calif., assignor to Airco, Inc., Montvale, N.J.

Filed Dec. 16, 1974, Ser. No. 532,806
Int. Cl.² C23C *15/00*
U.S. Cl. 204—192 **10 Claims**



1. A method of increasing the amount of material which can be sputtered from the target plate of a planar magnetron cathode wherein a glow discharge plasma is magnetically confined to an annular region adjacent to the target plate, comprising:

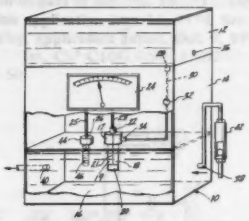
magnetically shifting a portion of the glow discharge plasma in a direction parallel to the target plate.

3. Apparatus for sputtering increased amounts of material from a planar sputtering source comprising anode means spaced from said source for establishing an electrostatic field therebetween, first magnet means for providing flux lines exiting said source and returning thereto along a curved path thereby defining an erosion region on said source in a closed loop configuration, second magnet means adapted to produce an auxiliary, variable magnetic field in a direction substantially normal to said source in the presence of said flux lines such that upon variation of said variable magnetic field, the location at which resultant flux lines are generally parallel to said source is continuously translated across said erosion region whereby said source is eroded to a generally uniform depth substantially throughout said erosion region.

3,956,094
APPARATUS FOR MONITORING AVAILABLE CHLORINE IN SWIMMING POOLS

Italo A. Capuano, Orange, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Mar. 29, 1974, Ser. No. 456,088
Int. Cl.² G01N 27/46
U.S. Cl. 204—195 R **4 Claims**



1. Apparatus for measuring the available halogen concentration of an aqueous solution comprising:
1. an electrode compartment,
2. inlet means for feeding said aqueous solution to said electrode compartment,
3. a self-cleaning sensing electrode positioned in said electrode compartment and having as a component a porous conductive material adapted to contact said aqueous solution,
4. a reference electrode positioned in said electrode compartment adapted to contact said aqueous solution,
5. an outlet in said electrode compartment for removing said aqueous solution,
6. a potential measuring means positioned in said electrode compartment, said potential measuring means having connecting means to said sensing electrode and said reference electrode, wherein an applied potential between said sensing electrode and said reference electrode is absent while measuring said available halogen concentration,
7. a solution compartment containing a pH control solution,
8. means for passing said pH control solution through at least a portion of said porous conductive material of said sensing electrode to control the pH at the surface of said sensing electrode adapted to contact said aqueous solution whereby said available halogen concentration is determined at said sensing electrode and registered on said potential measuring means.

3,956,095
SACRIFICIAL ANODE

Sian Wah Khoo, Etobicoke, and Ranald L. Hay, Caledon East, both of Canada, assignors to Canadian Gas Association, Don Mills, Canada

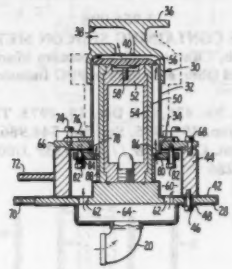
Filed July 31, 1974, Ser. No. 494,001
Claims priority, application Canada, Apr. 30, 1974, 198953
Int. Cl.² C23F 13/00; C25D 11/30
U.S. Cl. 204—197 **3 Claims**

1. An anode consisting of magnesium or magnesium alloy having a porous magnesium oxide coating thereon formed by (1) etching the surface to remove all surface impurities, (2) anodizing the anode for approximately 10 minutes in a solution of an electrolyte selected from the group of ammonium tartrate and sodium borate, at a current density of 10 MA/cm² to 50 MA/cm² using direct current at room temperature with a stainless steel cathode. (3) then reversing the current for about 5 minutes, (4) then allowing the anode to remain in the electrolyte for a period of about 30 seconds in the absence of any applied voltage, (5) anodizing again for a period of about 10 minutes, (6) then reversing the current again for about 5 minutes and (7) then allowing the treated anode to remain in the electrolyte for about 5 minutes in the absence of any applied voltage, said coating reducing the current delivery in high conductivity waters without impairing the protective efficiency of the anode.

3,956,096
APPARATUS FOR PLATING AIRCRAFT CYLINDERS

Peter C. Paulson, Pinole; Henri H. Henderson, Oakland, and Richard L. Worstell, Moraga, all of Calif., assignors to Electro-Coatings, Inc., Moraga, Calif.

Division of Ser. No. 344,142, March 23, 1973. This application Dec. 26, 1974, Ser. No. 536,437
Int. Cl.³ C25D 1/02, 3/04
U.S. Cl. 204—237 **3 Claims**



1. Apparatus for plating aircraft engine cylinder assemblies which comprises:
A. A base portion,
B. A substantially cylindrical anode mounted on said base portion with a non-conductive electrical shield on its end remote from said base and projecting generally radially outwardly from said anode,
C. Electrolyte pumping means for pumping a plating electrolyte around said anode adjacent to said base portion,
D. Electrically insulated clamping and sealing means for holding an aircraft engine cylinder assembly around said anode with the interior of said cylinder assembly connected to said pumping means for conducting electrolyte through the space between the cylinder interior and the anode,
E. Conductor means for passing direct electrical current between said anode and said cylinder assembly.

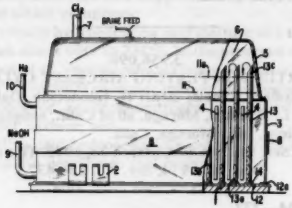
3,956,097
TITANIUM BLANKETS AND ANODE CONSTRUCTIONS FOR DIAPHRAGM CELLS

Vittorio de Nora, Nassau, Bahamas, and Oronzio de Nora, Milan, Italy, assignors to Electronor Corporation, Panama City, Panama

Filed July 5, 1974, Ser. No. 485,844
Int. Cl.² C25B 1/10, 1/14, 1/34
U.S. Cl. 204—252 **16 Claims**

1. In an electrolysis cell having a smoothly planar horizontal cell base, bus bars connected to said cell base, a cell can, and a cell top, vertical dimensionally stable anodes from the group consisting of hollow rectangular and hollow tube form and cathodes in said cell, an electrically conductive electrocatalytic coating on said anodes, a planar imperforate, conductive

blanket on said cell base supporting said cell can, said imperforate blanket supporting conductive strips in electrical



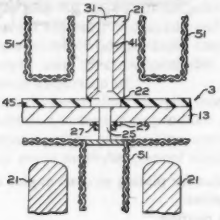
contact with said anodes and said blanket whereby current is conducted from said base to said anodes through said blanket.

3,956,098

APPARATUS CONTAINING SILICON METAL JOINTS

Cletus N. Welch, Clinton, and Aleksandrs Martinsons, Wadsworth, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 426,414, Dec. 19, 1973. This application Jan. 29, 1975, Ser. No. 544,986
Int. Cl.² C25B *11/00*; B23P *3/00*
U.S. Cl. 204—286 **1 Claim**



1. A silicon fabrication comprising:
a silicon member;
an electrodeposited coating of a material chosen from the group consisting of copper, nickel, tin, aluminum, zinc, silver, palladium, platinum, and gold on a surface of said silicon member;
a second metallic member bonded to said silicon member by an electrically conductive epoxy resin bonding material bonded to said electrodeposited coating.

3,956,099

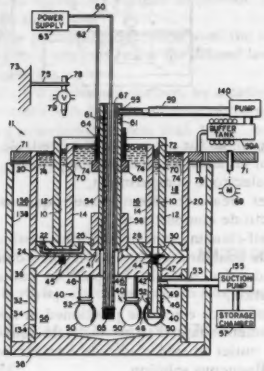
CONTINUOUS PREPARATIVE ELECTROPHORESIS APPARATUS

Louis Israel, 2453 Farmers Ave., Bellmore, N.Y. 11710, and Leslie Bernstein, 1 Aviemore Drive, New Rochelle, N.Y. 10804

Division of Ser. No. 302,347, Oct. 30, 1972, Pat. No. 3,873,432. This application Dec. 23, 1974, Ser. No. 535,571
Int. Cl.² G01N *27/00*, *27/26*, *27/40*
U.S. Cl. 204—299 R **14 Claims**

1. Apparatus for continuously electrophoretically separating and collecting the individual components of a mixture where such components have differing electrophoretic mobility rates comprising:
a separation chamber comprising
an electrophoretic supporting medium having a plurality of separating cells, each cell having an input and an output;
an applicator arrangement for supplying to each cell input in predetermined sequence an amount of said mixture;
a collector arrangement cooperating with said cell outputs in said same sequence for collecting discharge successively from said outputs; and
a power supply for inducing an electrical potential difference between said inputs and said outputs of said cells.

11. Apparatus for continuously electrophoretically separating and collecting the individual components of a mixture where such components have differing electrophoretic mobility rates comprising



a circular disc of a separating medium, said disc having a center and a periphery, said disc having a plurality of compartments each extending between said center and said periphery, each of said compartments having an input and an output;
a power supply for inducing an electrical potential difference between said inputs and said outputs;
an applicator for supplying the mixture to be separated to the inputs in a predetermined sequence;
a collector cooperating with said disc in said same sequence for collecting the separated components as said components discharge at an output.

3,956,100

CREOSOTE AND A METHOD FOR PRODUCING THE SAME

Donald V. Todd, Murrysville, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

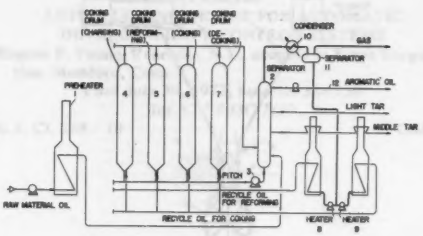
Filed Mar. 31, 1975, Ser. No. 563,639
Int. Cl.² C07C *37/00*
U.S. Cl. 208—2 **15 Claims**

1. A process for producing an improved creosote wood preservative having a reduced tendency to form crystals and a lighter color than a conventional coal tar creosote, comprising:
subjecting a conventional coal tar creosote to a mild hydrogenation to reduce the aromaticity index by 10–62%, whereby the improved creosote wood preservative is produced.

3,956,101
PRODUCTION OF COKES

Naoyoshi Hara; Akihiro Fujimori, both of Yokohama; Hideo Hashimoto, Sagamihara; Takuji Hosoi, Tokyo; Takaaki Aiba, Yokohama, and Tsuneo Okamoto, Kawaguchi, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo and Chiyoda Kako Kensetsu Kabushiki Kaisha, both of, Japan

Continuation-in-part of Ser. No. 187,517, Oct. 7, 1971, abandoned. This application Jan. 14, 1974, Ser. No. 432,888
Claims priority, application Japan, Oct. 9, 1970, 45-88228
Int. Cl.[2] C10G *9/36, 37/02*
U.S. Cl. 208—50 **8 Claims**



1. A process for producing high grade needle-shaped cokes which comprises:

A. charging a raw material oil selected from the group consisting of (a) residual oils resulting from distillation or solvent extraction of petroleum to separate light fractions therefrom, (b) heavy tars and pitches resulting from pyrolysis of petroleum oils, (c) heavy tars and pitches of *b* which have been subjected to thermal reforming, (d) coal tars and coal pitches and (e) mixtures of such raw materials which melt at a temperature below 250° to 450°C to a liquid state, into a coking drum,

B. reforming the charged raw material oil in the coking drum by heating said oil as a liquid pool at a temperature of from 300° to 400°C under a pressure of from 2mmHg to 3 atmospheres for from 0.5 to 10 hours,

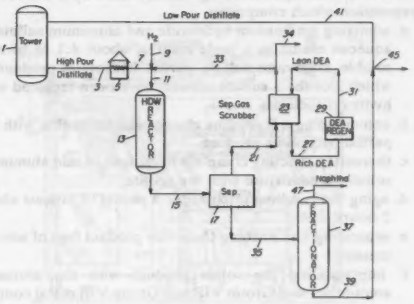
C. coking the liquid pool reformed raw material oil by heating said oil in the coking drum at a temperature of from 400° to 500°C under a pressure higher than atmospheric pressure while blowing a non-oxidizing gas selected from the group consisting of vaporized hydrocarbon oil, hydrogen, nitrogen and steam heated at a temperature higher than that of the reformed raw material oil by at most 300°C into the bottom of the coking drum and through said liquid pool at a flow rate of from 5 to 50 millimeters/second, calculated on the basis of the flow velocity of the gas through the empty coking drum, until coking of the reformed raw material oil has been substantially completed, thereby simultaneously heating and agitating the reformed raw material oil within the coking drum to secure uniform heating of the reformed raw material oil, removal of excess heat generated in the coking drum and promotion of crystal orientation of the coke to be produced, and

D. decoking the product thus produced, the entire process being carried out in the absence of, and without formation of, a fluidized bed.

3,956,102
HYDRODEWAXING

Nai Yuen Chen, Titusville; Bernard M. Gillespie, Pitman; Henry R. Ireland, Woodbury, and Thomas R. Stein, Cherry Hill, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed June 5, 1974, Ser. No. 476,493
Int. Cl.[2] C10G *13/00, 41/00*
U.S. Cl. 208—93 **7 Claims**



1. In the method for catalytically hydrodewaxing a petroleum distillate by contact of said distillate and hydrogen with a ZSM-5 type catalyst, the improvement which comprises: fractionating said distillate into a high pour-point stream having a four point greater than about 30°F and a low pour-point stream having a pour point less than about 30°F; hydrodewaxing said high pour point stream with said ZSM-5 type catalyst at a temperature of about 500°F to 850°F. a liquid hourly space velocity of about 0.5 to 10 LHSV, and a hydrogen pressure of about 100 to 1,500 p.s.i.g., whereby there is no consumption of hydrogen; and combining the hydrodewaxed stream with said low pour-point stream.

3,956,103
HYDROCARBON CONVERSION WITH AN ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Arlington Heights, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Mar. 5, 1975, Ser. No. 555,648
Int. Cl.[2] C10G *35/08;* B01J *11/08;* C10G *13/02;* C07C *5/28*
U.S. Cl. 208—139 **15 Claims**

1. A process for converting a hydrocarbon which comprises contacting the hydrocarbon at hydrocarbon conversion conditions with an acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum or palladium, about 0.01 to about 2 wt. % rhodium, about 0.01 to about 2 wt. % rhenium, and about 0.1 to about 3.5 wt. % halogen, wherein the platinum or palladium, rhodium, and rhenium are uniformly dispersed throughout the porous carrier material, wherein substantially all of the platinum or palladium is present in the elemental metallic state, wherein substantially all of the rhenium and rhodium are present in the elemental metallic state or in a state which is reducible to the elemental metallic state under hydrocarbon conversion conditions or in a mixture of these states.

3,956,104

HYDROCRACKING PROCESS

Lee Hilfman, Mount Prospect, and Edward Michalko, Chicago, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Aug. 9, 1974, Ser. No. 496,241
Int. Cl.² C10G 13/02; B01J 29/12
U.S. Cl. 208—111 7 Claims

1. A process for converting a hydrocarbon charge stock into lower boiling, normally liquid hydrocarbon products which comprises reacting said charge stock and hydrogen at hydrocracking conditions in contact with a catalytic composite of an alumina, a crystalline aluminosilicate zeolite, from about 6 to about 20 wt. % of a Group VIB metal component and from about 0.1 to about 10 wt. % of a Group VIII metal component, said catalytic composite being characterized by a method of preparation which comprises:

a. admixing ammonium hydroxide and aluminum sulfate in aqueous media in a mole ratio of about 4:1 to form a soluble aluminum sulfate partial hydrolysis product in which 2 of the 3 sulfate radicals have been replaced with hydroxyl radicals;
b. commingling a crystalline aluminosilicate zeolite with the partial hydrolysis product;
c. thereafter effecting complete hydrolysis of said aluminum sulfate in admixture with the zeolite;
d. aging the resulting mixture for a period of at least about 2 hours;
e. separating and washing the solids product free of soluble matter;
f. impregnating the solids product with the aforesaid amounts of said Group VIB and Group VIII metal components; and
g. calcining the resulting composite at a temperature of from about 1100° to about 1700°F.

3,956,105

HYDROPROCESSING OF HYDROCARBONS

John E. Conway, La Grange, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 484,519, July 1, 1974. This application Apr. 24, 1975, Ser. No. 571,339
Int. Cl.² C10G 13/06; B01J 29/12
U.S. Cl. 208—111 12 Claims

1. A process for hydrocracking a hydrocarbonaceous charge stock into lower molecular weight hydrocarbons which comprises reacting said charge stock with hydrogen, at a temperature of about 400°F. to 900°F., a pressure of about 800 to 5000 psig., a liquid hourly space velocity of about 0.25 to 10 and a hydrogen circulation rate of about 3000 to 50,000 scf./Bbl. in contact with a catalytic composite of from about 4 to about 30 weight percent Group VI-B metal, from about 0.1 to about 30 weight percent Group VIII metal and a refractory inorganic oxide carrier material which is prepared in the following manner:

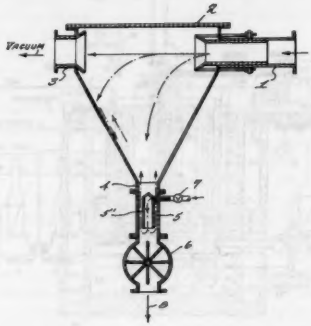
a. dry mixing a finely divided Group VI-B metal compound, a Group VIII metal compound and a refractory inorganic oxide, said metal compound being utilized in an amount to provide from about 25 to about 90% of the Group VI-B metal component of the final catalytic composite, and from about 25 to about 90% of the Group VIII metal component;
b. peptizing the mixture and forming an extrudable dough;
c. extruding said dough and calcining extrudate with a Group VI-B metal compound and a Group VIII metal compound, said metal compound being utilized in an amount to provide a final catalytic composite containing from about 4 to about 30 weight percent Group VI-B metal and from about 0.1 to about 10 weight percent Group VIII metal; and,
e. calcining the resulting composite in an oxidizing atmosphere.

3,956,106

APPARATUS AND PROCESS FOR THE PRODUCTION OF GRIT FREE FINELY DISPERSED PIGMENTS

Gustav Mück, Bruhl; Lothar Rothbühr, Hermulheim, and Kurt Stoklossa, Bruhl, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfort am Main, Germany

Filed Feb. 11, 1974, Ser. No. 441,388
Claims priority, application Germany, Mar. 19, 1973, 2313614
Int. Cl.² B07B 7/01
U.S. Cl. 209—11 11 Claims



1. Apparatus for the removal of grit from a gas stream pneumatically conveying a finely dispersed solid, said apparatus comprising

a closed separator housing having an upper portion and a funnel-shaped lower portion,

means for introducing said gas stream into said upper portion of said housing, said means comprising a laterally disposed supply tube having a cross-sectional area substantially less that the cross-sectional area of said upper portion of said housing,

means for allowing the removal of grit from said gas supply stream as grit falls from said gas stream due to the differential in cross-sectional area between said supply tube and said housing, said means comprising a discharge valve disposed below said housing lower portion, and a vertically disposed connecting member between the lower extremity of said funnel-shaped lower housing portion and said discharge valve,

means for withdrawing gas having finely dispersed solid but substantially no grit therein from said housing, said means including an outlet tube extending laterally from said housing upper portion, and

means for regulating the range of size of finely dispersed solid and grit that will be removed from said gas stream in said housing, said means including an axially disposed cap-shaped displacement member having an opening in the lower end thereof and disposed in said vertically disposed connecting member, said displacement member having a smaller cross-sectional area than the cross-sectional area of said connecting member and being located substantially concentrically with said connecting member so that an annular gap is formed therebetween, and means for supplying secondary gas under pressure to said displacement member so that a secondary gas stream flow therethrough and upwardly into said separator housing.

3,956,107

NICKEL-CONTAINING REFORMING CATALYST AND PROCESS

Howard Lee Mitchell, III, Baton Rouge, La., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Oct. 29, 1973, Ser. No. 410,711
Int. Cl.² C10G 35/08; B01J 27/02, 27/06, 23/42
U.S. Cl. 208—139 20 Claims

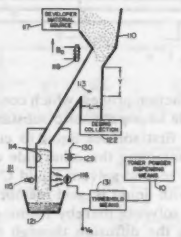
11. A process for improving the octane quality of naphthas comprising contacting the said naphtha at reforming conditions with a composite comprising a porous inorganic oxide support, platinum in concentration ranging from about 0.1 to about 1 percent, iridium in concentration ranging from about 0.1 to about 1 percent, and nickel in concentration ranging from about 0.0010 to about 0.0050 percent, based on the total weight of the catalyst, the atom ratio of the platinum:iridium ranging from about 0.25:1 to about 5:1.

3,956,108

ANTI-PLUGGING DEVICE FOR AUTOMATIC DEVELOPABILITY CONTROL SYSTEMS

Eugene F. Young, Henrietta, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed July 30, 1973, Ser. No. 384,138
Int. Cl.² B03C 1/30
U.S. Cl. 209—10 11 Claims



1. Apparatus for separating debris material from a magnetic developer material comprising:

means for supplying said magnetic developer material;

chute means for receiving said magnetic developer material and debris material intermingled therewith at the ingress thereof, said chute means being inclined from vertical and having an aperture defined therein through which debris material falls, said aperture formed in the lower surface of said chute means intermediate the ingress and egress thereof;

automatic developability control means for monitoring the developability of said magnetic developer material, said automatic developability control means disposed in a receiving relationship with respect to the egress of said chute means; and

means for providing a magnetic force to prevent said magnetic developer material from falling through said aperture in said chute means.

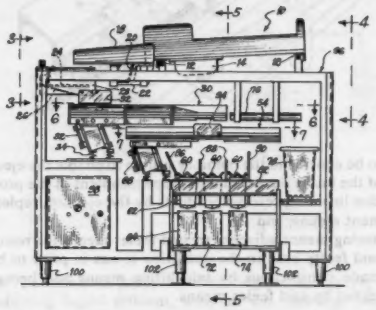
3,956,109

AUTOMATIC SILVERWARE SORTING CONSTRUCTION

Robert B. Dietsche, Deerfield, Ill., assignor to Avant Industries, Inc., Wheeling, Ill.

Filed Oct. 24, 1974, Ser. No. 517,635
Int. Cl.² B07C 1/10
U.S. Cl. 209—73 3 Claims

1. In a sorting apparatus for silverware consisting of knives, forks and spoons including a conveyor bed, and means moving the silverware from one location to another over said bed, the improvement comprising barrier means disposed on said bed for engagement by the silverware, said barrier means comprising at least one member disposed substantially centrally on said bed and extending longtitudinally of said bed and having a pair of substantially vertically extending side walls on opposite sides of the barrier means, said bed sloping downwardly and inwardly toward said side walls whereby said silverware is caused to move against said side walls, said means for moving the silverware comprising vibrating means associated with said bed for moving said silverware along said bed and into engagement with said side walls, openings defined by each side wall of said barrier means said openings being dimensioned so that the knives are adapted to pass through the openings, the curvature of the spoons and forks imparting an effective width thereto and the dimensions of said opening being less than said effective width so that the spoons and forks will not pass through the openings, means for collecting knives passing through the bed comprising a channel disposed beneath said barrier means, said knives being directed through said openings into said channel, and further openings defined by said channel for the passage of knives beyond the channel, a second bed positioned beneath said first mentioned bed, said knives being collected on said second bed, and openings defined by said second bed for the passage of said knives through said second bed, and means for receiving knives passed through said second bed, and wherein said first mentioned bed extends over said second bed to a position beyond said openings in said second bed, at least one additional opening defined by said first bed dimensioned for the passage of forks and spoons therethrough, said forks and spoons being discharged through said additional opening from said first mentioned bed onto said second bed at a location beyond said openings in said second bed, at least one slot defined by said second bed dimensioned to allow the passage of said forks through the second bed, and means positioned beneath said second bed for collecting said forks.



3,956,110

DEVICE FOR CHECKING THAT THE UNDERNEATH PART OR BASE, PARTICULARLY OF PACKETS OF CIGARETTES AND SIMILAR, HAS BEEN PROPERLY SEALED DOWN

Enzo Seragnoli, Bologna, Italy, assignor to G. D. Societa per Anzioni, Bologna, Italy

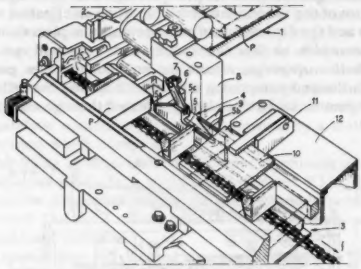
Filed May 29, 1974, Ser. No. 474,440
Claims priority, application Italy, July 11, 1973, 3450/73
Int. Cl.² B07C 1/10
U.S. Cl. 209—82 6 Claims

1. A checking device for use in an apparatus for packaging cigarettes or similar material in a production line, said apparatus including at least one wrapping machine, at least one overwrapping machine linked by a conveyor to said wrapping machine, an ejection/replenishment means located downstream of said wrapping machine for ejecting packets from the production line and for replenishing the production line with reserve packets, at least one checking means for checking for the presence of faulty packets and emitting a signal when one is found, and a memory system for storing signals received from said checking means for activating said ejection/replen-

ishment means after a delay sufficient to allow the faulty packet to reach said ejection/replenishment means, said checking device comprising:

lifting means for rendering a faulty base on a wrapped packet conspicuous;

feeler means adjacent to said lifting means for detecting the presence of a conspicuous base and for causing a signal



to be emitted to the memory system to enable the ejection of the faulty packet and the replenishment of the production line with reserve products by the ejection/replenishment means; and

restoring means adjacent to said feeler means for restoring said faulty base to the condition it was in prior to being made conspicuous by said lifting means and being detected by said feeler means.

3,956,111

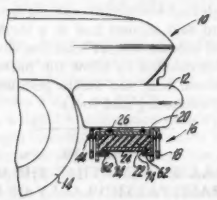
ELECTRO-MAGNETIC ROAD HAZARD ELIMINATOR FOR VEHICLES

Arthur F. Manfredi, 2158 Beverly Road, Brooklyn, N.Y. 11226

Filed Oct. 18, 1974, Ser. No. 515,813

Int. Cl.² B03C *1/30*

U.S. Cl. 209—215 **11 Claims**



5. A road cleaning device for mounting on a vehicle's front bumper in front of the vehicle's front tires to pick up magnetically attractable road hazards such as nails, screws, tacks, bolts, miscellaneous scraps of metal and the like, said device comprising electro-magnetic means for picking up the magnetically attractable road hazards, support means for securing in a stationary relationship said electro-magnetic means to a bottom portion of the front bumper which is disposed in front of the front tires, cushioning means disposed between said electro-magnetic means and the front part of the vehicle for dampening sound of the road hazards striking said electro-magnetic means as said road hazards are picked up by said electro-magnetic means, said cushioning means being disposed against said electro-magnetic means, said cushioning means being fabricated from a non-electrically conductive material, holding means for securing said electro-magnetic means against said cushioning means in a fixed relationship to each other, said support means including a support member and an open box-like housing, said cushioning means and electro-magnetic means being disposed in said housing with a surface of said electro-magnetic means being exposed for picking up the road hazards, first fastening means for securing said support member to the front bumper of the vehicle, and second fastening means for securing said housing to said support member.

3,956,112

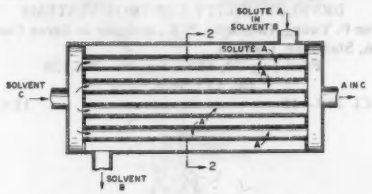
MEMBRANE SOLVENT EXTRACTION

Lester T. C. Lee, Parsippany, N.J.; Win-Sow Ho, Webster, N.Y., and Kang-Jen Liu, Somerville, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 320,341, Jan. 2, 1973, abandoned. This application Mar. 13, 1975, Ser. No. 558,189

Int. Cl.² B01D *11/04, 13/00, 13/04*

U.S. Cl. 210—22 C **20 Claims**



1. A solvent extraction process which comprises the steps of contacting one side of a polymeric substantially non-porous membrane with a first solvent liquid B containing a solute material A and contacting the other side of said membrane with an extracting second solvent liquid C which is substantially immiscible with liquid B, said membrane being swollen by the respective solvents thereby forming an intermediary zone and allowing the diffusion through the swollen membrane of the solute material A while preventing direct phase to phase contact between solvent liquids B and C, and wherein the diffusivity of A in the membrane from B and C is in the range of about 1×10^{-9} to about 1×10^{-6} cm²/sec., and maintaning the separation of liquids B and C by said membrane until said solute A has been substantially extracted from liquid B through a solvent swollen membrane into liquid C.

3,956,113

PROCESS FOR THE MANUFACTURE OF AMINO COMPOUNDS FIXED TO CARRIERS

Max Brenner, Spiegelbergstrasse 33, CH-4059 Basel, Switzerland

Filed Nov. 23, 1973, Ser. No. 418,238

Claims priority, application Switzerland, Nov. 22, 1972, 17021/72; Nov. 8, 1973, 15692/73

Int. Cl.² B01D *13/00*

U.S. Cl. 260—112 R **28 Claims**

1. Process for the manufacture of reaction products from a water-soluble amino compound which is capable of substitution on at least one basic nitrogen atom, and an activated carrier,

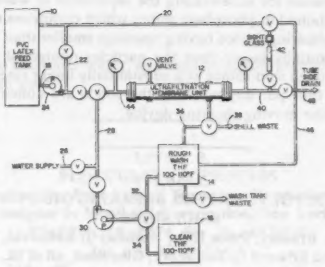
wherein (a) (1) a cyanide compound selected from the group consisting of hydrocyanic acid and alkali metal cyanides and (2) a reagent containing positive halogen selected from the group consisting of hypochlorous acid, hypobromous acid, water-soluble salts of hypochlorous acid, water-soluble salts of hyprobromous acid, chlorine compounds which on hydrolysis yield hypochlorous acid, bromine compounds which on hydrolysis yield hypobromous acid and mixtures of said reagents, are allowed to act on a water-soluble or water-swellable polyhydroxy compound in an alkaline medium,

b. the reaction mixture is freed of low molecular constituents,
c. the resultant cross-linked activated product is allowed to act, in the presence of water, at a temperature below about 50°C, on the water-soluble amino compound, and
d. dialysable material or material which has remained in dissolved form in the resultant reaction product is dialysed or filtered or washed out of the reaction product by means of water or an aqueous salt solution.

3,956,114
PROCESS FOR THE CONCENTRATION OF POLYVINYL-CHLORIDE EMULSION

Joseph Del Pico, Brockton, and Shmuel Sternberg, Waltham, both of Mass., assignors to Abcor, Inc., Cambridge, Mass.

Filed Aug. 31, 1973, Ser. No. 393,398
Int. Cl.² B01D *13/00*
U.S. Cl. 210—23 F **19 Claims**



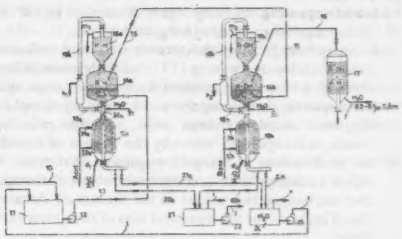
1. In a process for concentrating or separating an aqueous polymer-containing emulsion in an ultrafiltration semipermeable membrane device comprising a feed zone and a permeate zone, the zones separated by a semipermeable membrane adapted to prevent the passage of the polymer through the semipermeable membrane to provide a permeate-rich solvent fraction and a polymer-rich fraction, the process comprising: introducing the polymer emulsion into the feed zone; removing a permeate-rich solvent fraction from the permeate zone; removing a polymer-rich fraction from the feed zone, the improvement which comprises:

a. interrupting the process periodically or when the flux rate through the semipermeable membrane falls below a desired flux rate value; and
b. contacting the semipermeable membrane with a nonaqueous solvent for the polymer which is being concentrated or separated for a time sufficient to restore the flux value of the semipermeable membrane in the process to its desired value, the semipermeable membrane material characterized by being solvent-resistant to the solvent employed in contacting the membrane.

3,956,115
PROCESS FOR THE REGENERATION OF ION-EXCHANGE RESINS AND APPLICATIONS THEREOF

Nicolae Mihai Arion, Bucharest, Romania, assignor to Institutul de Proiectari Pentru Industria Chimica Anorganica si A Ingrasamintelor, Bucharest, Romania

Continuation of Ser. No. 474,022, May 28, 1974, abandoned, which is a continuation-in-part of Ser. No. 313,091, Dec. 7, 1972, abandoned, which is a continuation of Ser. No. 80,019, Oct. 12, 1970, abandoned. This application June 23, 1975, Ser. No. 589,080
Claims priority, application Romania, Oct. 11, 1969, 61236
Int. Cl.² C02B *1/70, 1/76*
U.S. Cl. 210—30 R **5 Claims**



1. A continuous process for treating and recovering an ion containing liquid influent, with an ion exchange resin, bu portions, comprising

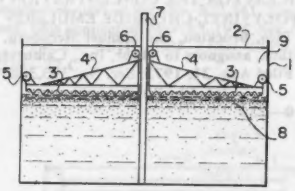
1. asecndent flowing a stream of liquid influent with cations, through a first fixing zone of a cation exchange unit, of a loop system, containing therein a compacted bed of strongly acidic cation exchange resin, of styrene-divinylbenzene type, with high cross-linking degree, having 16–20% divinyl-benzene, sulphonated at 100°C, in beads, macroporous, whereby the stream of liquid influent with cations, flowing through said first zone, in said cation exchange unit, contacts said cation exchange resin and exchange the cations in the stream of liquid influent for the hydrogen ions of the cation exchange resin;
2. withdrawing a decationized liquid influent stream, from said first zone of said cation exchange unit;
3. hydraulically passing said cation exchange resin, loaded with cations, from step (1), into a second zone, in said cation exchange unit, discharging the liquid and removing any non-discharged liquid remainder between the compacted beads of said exchange resin with a flow of inert gas;
4. contacting the cation exchange resin, loaded with cations and with the transport liquid removed from its interstices, from step (3), with a strongly concentrated nitric acid of 45 to 60%, by weight, used in great excess, as regenerant, to regenerate said cation exchange resin, under the conditions of maintaining the resin temperature at the interface of the regenerant acid/resin bead at a maximum of about 20°C, by suitably correlating the values of the regeneration parameters, i.e. the regenerant temperature of 0°–15°C, the regenerant volume of 10–30 times the resin bulk volume, the circulating bulk velocity of the regenerant of 10–50 m/h, and the thickness of the resin bed of a maximum of 0.600m;
5. withdrawing an effluent strongly concentrated in nitric acid and with the eluated salts from the regeneration of said exchange resin, at step (4), from said cation exchange unit;
6. removing any remainder of said strongly concentrated effluent, from step (5), which has remained non-discharged in the interstices between the beads of said exchange resin, with a flow of inert gas;

7. rinsing the regenerated cation exchange resin from step (6) with cooled rinsing water;
8. hydraulically passing said cation exchange resin, rinsed at step (7), into a third loosening zone of said cation exchange unit, wherein fine resin particles which have resulted in steps (1)–(7) are eliminated, in an ascendent water flow, said fine particles being eliminated by overflowing, drawn out by the loosening water;
9. hydraulically passing said cation exchange resin, loosened by water at step (8), into a fourth feeding zone of said cation exchange unit, wherein the transport water is removed by overflowiing, while the resin is compacted;
10. hydraulically passing said cation exchange resin, compacted at step (9) from the feeding zone, into the first cation fixing zone, of step (1), in said cation exchange unit and discharging therefrom the hydraulic transport water;
11. and repeating the same cycle of steps (1)–(10), in said cation exchange unit, as long as desired;
12. ascendent flowing the stream of liquid influent with ions, decationized in step (11) and withdrawn in step (2), through a first fixing zone of a anion exchange unit, of a loop system, containing therein a compacted bed of middle basic anion exchange resin, of polyacrylic type, in beads, macroporous, whereby the stream of liquid influent with anions, flowing through said first zone, in said anion exchange unit, contacts said anion exchange resin and exchanges the anions in the stream of decationized liquid influent for the hydroxyl ions of the anion exchange resin;
13. withdrawing a stream of dimineralized liquid influent from said first zone of said anion exchange unit;
14. hydraulically passing said anion exchange resin, loaded with anions at step (12), into a second zone of said anion exchange unit, dischargint the liquid and removing any non-discharged liquid remainder between the compacted beads of said anion exchange resin, with a flow of inert gas;
15. contacting the anion exchange resin, loaded with anions, and with the liquid removed from its interstices, at step (14), with strongly concentrated ammonia solution of 20 to 25% by weight, used in small excess, as regenerant, to regenerate said anion exchange resin;
16. withdrawing an effluent, concentrated in the eluated salts, also containing the small ammonia excess, from the regeneration of said exchange resin, at step (15), in said anion exchange unit;
17. removing any remainder of said effluent concentrated in eluated salts, from step (16), which has remained non-discharged in the interstices between the beads of said exchange resin, with a flow of inert gas;
18. rinsing the regenerated anion exchange resin from step (17) with rinsing water;
19. hydraulically passing said anion exchange resin, rinsed at step (18), into a third loosening zone of said anion exchange unit, wherein fine resin particles which have resulted in steps (12)–(19), are eliminated, in an ascendent water flow, said fine particles being eliminated by overflowing, drawn out by the loosening water;
20. hydraulically passing said anion exchange resin, loosened by water at step (18), into a fourth feeding zone of said anion exchange unit, wherein the water is removed by overflowing, while the resin is compacted;
21. hydraulically passing said anion exchange resin, compacted at step (20), from the fourth feeding zone into the first anion fixing zone, at step 12, in said anion exchange unit and discharging therefrom the hydraulic water;
22. and repeating the same cycle of steps 12–21 in said anion exchange unit, as long as desired; and
23. passing the demineralized liquid influent flow, from step (13), through ion exchange resins, in a mixed bed, to remove any escaped cations and anions, and utilizing the effluent as highly demineralized water.

3,956,116
PROCESS FOR SEPARATING LIQUIDS FROM SUSPENSIONS

L. Warren Brandt, Tuscaloosa, Ala., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Oct. 16, 1974, Ser. No. 515,390
Int. Cl.² B01D 5/00
U.S. Cl. 210—42 R **7 Claims**



1. A process for accelerating the separation of water from solids contained in phosphate slimes which comprises moving a porous shearing device having openings smaller than 2 mesh but substantially larger than the particles contained in said slimes through said slimes at a substantially linear rate of less than one foot per day whereby the solids are concentrated ahead of the moving shearing device.

3,956,117
CATIONIC POLYMERS FOR BREAKING OIL-IN-WATER EMULSIONS

Robert L. Bradley, Palos Hills; Anthony J. Sadowski, Naperville, and Edward G. Ballweber, Glenwood, all of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Nov. 29, 1974, Ser. No. 528,513
Int. Cl.² B01D 5/00
U.S. Cl. 210—43 **8 Claims**

1. A method for resolving oil-in-water emulsions which comprises the steps of:
A. Treating said emulsions with at least 5 ppm and not more than 1000 ppm by weight of a water-soluble condensation copolymer consisting essentially of 1,4-dichloro-2-butene and dimethylamine,
B. Mixing said water-soluble copolymer with the emulsions for a period of time sufficient to break the emulsion whereby a separate and distinct aqueous phase and oil phase is produced, and then,
C. Separating the oil phase from the aqueous phase.

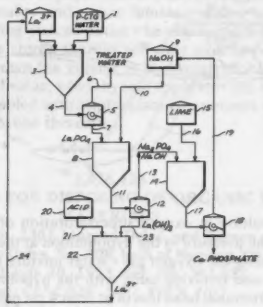
3,956,118
REMOVAL OF PHOSPHATE FROM WASTE WATER

Eugene V. Kleber, Woodland Hills, and Howard L. Recht, Northridge, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 731,540, May 23, 1968, abandoned. This application Oct. 1, 1970, Ser. No. 77,389
Int. Cl.² C02C 5/02
U.S. Cl. 210—45 **14 Claims**

1. The method for chemically treating waste water to remove phosphate-containing anions present therein which includes the steps for direct removal of said anions consisting essentially of adding a trivalent rare earth cation in soluble form to the waste water to react with the phosphate-contain-

ing anions to form an insoluble rare earth precipitate of said trivalent rare earth cation and said phosphate-containing



anions in the waste water, and separating this precipitate from the waste water.

3,956,119

FLOCCULATION PROCESS

John C. Davidtz, East Amwell Township, Hunterdon County, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 19, 1974, Ser. No. 443,540
Int. Cl.² B01D 21/01
U.S. Cl. 210—47 2 Claims

1. A method for flocculating phosphate slimes which comprises:

a. slurrying topsoil and water
b. allowing the slurried topsoil to settle;
c. decanting an aqueous extract which contains water soluble organic matter that has been dissolved into said extract from the slurried topsoil;
d. adjusting the decanted aqueous extract until it contains at least 50 parts per million of said organic matter;
e. intermixing at an ambient temperature a phosphate slimes waste that has a solids content of at least 2 wt. percent with the adjusted and decanted extract, whereby a flocculated mixture is produced; and
f. separating water from said flocculated mixture.

3,956,120

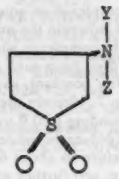
ELECTRODEPOSITION OF COPPER

Otto Kardos, Ferndale; Donald A. Arcilesi, Mount Clemens, and Silvester P. Valayil, Pontiac, all of Mich., assignors to M & T Chemicals Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 315,112, Dec. 14, 1972, abandoned. This application Nov. 21, 1974, Ser. No. 525,965
Int. Cl.² C25D 3/38
U.S. Cl. 204—52 R 4 Claims

1. A process for electrodepositing copper from an aqueous acidic copper plating bath containing at least one member independently selected from each of the following two groups:

A. 0.005 to 40 grams per liter of a bath soluble amine selected from those exhibiting the formula:

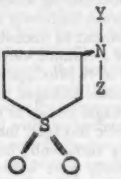


wherein Y and Z are independently selected from the group consisting of hydrogen, benzyl, phenyl, R-SO_3^- wherein R is an alkyl of from one to seven carbon atoms;

and B. sulfoalkyl sulfide compounds containing the grouping —S-Alk-SO_3M where M is one gram-equivalent of a cation and —Alk— is a divalent aliphatic hydrocarbon group of 1 to 8 carbon atoms in an amount of 0.01 milligrams per liter to 1000 milligrams per liter.

2. A process for electrodepositing copper from an aqueous acidic copper plating bath containing at least one member independently selected from each of the following three groups:

A. 0.005 to 40 grams per liter of a bath soluble amine selected from those exhibiting the formula:



wherein Y and Z are independently selected from the group consisting of hydrogen, benzyl, phenyl, R-SO_3^- wherein R is an alkyl of from one to seven carbon atoms;

B. sulfoalkyl sulfide compounds containing the grouping —S-Alk-SO_3M where M is one gram-equivalent of a cation and —Alk— is a divalent aliphatic hydrocarbon group of 1 to 8 carbon atoms in an amount of 0.01 milligrams per liter to 1000 milligrams per liter; and

C. condensation products of formaldehyde and naphthalene sulfonic acids in an amount of from 0.01 to 5.0 grams per liter.

3,956,121

PROCESS FOR THE PRECIPITATION OF HEAVY METAL ION-POLYCARBOXYLATE COMPLEXES

Heinz Haschke, Grossauheim; Helmut Knorre, Seligenstadt; Gerhard Morlock, and Gerhard Pohl, both of Grossauheim, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

Filed Nov. 11, 1974, Ser. No. 522,799
Claims priority, application Germany, Nov. 15, 1973, 2356963
Int. Cl.² C02B 1/20
U.S. Cl. 210—53 16 Claims

1. A process for precipitating heavy metal ion-polycarboxylate complexes from an aqueous metal processing effluent said process comprising adding to said aqueous effluent containing

at least one of said complexes an aqueous solution of a water soluble aluminum salt, wherein the anion of said salt does not form any water soluble complexes with said heavy metal ions to be precipitated or does form such anion-heavy metal complexes having a stability constant, expressed as their decadic logarithm, of less than 2; wherein the aluminum salt is added in an amount corresponding to 0.9 to 1.8 moles of aluminum ions per equivalent of polycarboxylate; adjusting the pH of the resulting reaction mixture to about 6.5 to about 9.0 with an alkali metal carbonate; and further wherein said heavy metal ions are selected from the group consisting of zinc, cadmium, copper, nickel, cobalt, iron and chrome; and said polycarboxylate has a mean degree of polymerization of about 5 to about 500, said polycarboxylate being selected from the group consisting of poly(aldehydocarboxylates), poly(hydroxycarboxylates) and poly(hydroxyaldehydocarboxylates); and separating the resulting precipitate from said solution.

3,956,122

CATIONIC ARYLAMIDE-STYRENE COPOLYMERS AND FLOCCULATION OF SEWAGE THEREWITH

Anthony Thomas Coscia, South Norwalk; Hans Peter Panzer, and John Andrew Sedlak, both of Stamford, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 316,630, Dec. 18, 1972, abandoned. This application Dec. 12, 1974, Ser. No. 531,948

Int. Cl.² B01D *21/01*

U.S. Cl. 210—54 **11 Claims**

1. A process for flocculating solids suspended in aqueous medium, which comprises uniformly adding to said medium a small but effective amount as flocculant for said solids of an aqueous dispersion of a cationic vinyl polymer comprising at least 40 mol percent of N-[di(C_{1-3}alkyl)aminomethyl]acrylamide hydrophilic cationic linkages, at least 5 mol percent of vinyl hydrophobic linkages and up to 10 mol percent of acrylic acid hydrophilic anionic linkages, the number of said hydrophobic linkages being sufficiently large that the polymer is insoluble in substantially pure water and being sufficiently small that the polymer is auto-dispersible in substantially pure water, distributing said polymer through said medium thereby flocculating a substantial proportion of said solids, and separating said flocculated solids and said medium.

3,956,123

ADDITIVE FOR ELECTRODEPOSITION OF BRIGHT TIN AND TIN-LEAD ALLOY

William E. Rosenberg, Strongsville, and William E. Eckles, Cleveland Heights, both of Ohio, assignors to R. O. Hull & Company, Inc., Cleveland, Ohio

Division of Ser. No. 443,406, Feb. 19, 1974. This application Mar. 12, 1975, Ser. No. 557,798

Int. Cl.² C25D *3/32, 3/60*

U.S. Cl. 204—54 R **14 Claims**

1. A brightening agent for an aqueous acid tin electroplating bath consisting essentially of naphthalene monocarboxaldehyde and a coupling agent of an emulsifying agent selected from the class consisting of amphoteric or nonionic surfactants, or mixtures thereof, effective to solubilize the naphthalene monocarboxaldehyde in a plating bath.

3,956,124

HYPOLIMNION OXYGENATION

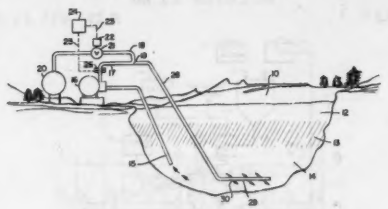
Arlo Wade Fast, Pacifica, Calif.; William Edward Grunert, Tonawanda, and John Joseph Pietruszewski, Buffalo, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Nov. 25, 1974, Ser. No. 527,158

Int. Cl.² C02B *1/34*

U.S. Cl. 210—63 R **8 Claims**

1. A process for oxygenation of the hypolimnion of thermally stratified water bodies comprising the steps of: Withdrawing water from the hypolimnion at rate between 10 and 200 percent of the hypolimnion volume per month; pressurizing the withdrawn water to superatmospheric pressure below 125 psig; injecting at least 80 percent oxygen (by volume) gas in the withdrawn pressurized water at rate between 5 and 300 lbs. oxygen per million pounds withdrawn water but less than



a rate resulting in oxygen supersaturation of the withdrawn water at the pressure in the hypolimnion at the point of remixing; returning the oxygen gas - water mixture through conduit means to and remixing same with the hypolimnion at rate to produce frictional head loss of at least 4 psi per 100 feet length of said conduit means, and also at least 0.15 psi per pound of injected gas per one million pounds withdrawn water.

3,956,125

FILTRATION APPARATUS

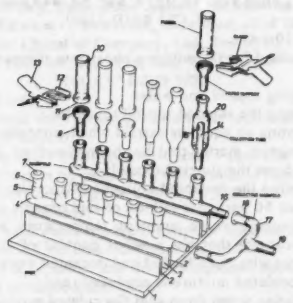
Peter Strutt, Bramcote, and Terrance Lymn, Glen Parva, both of England, assignors to Strutt & Farrands Ltd., Bramcote, England

Filed Aug. 12, 1974, Ser. No. 497,116

Claims priority, application United Kingdom, Aug. 17, 1973, 38884/73

Int. Cl.² B01L *3/00*

U.S. Cl. 210—94 **3 Claims**



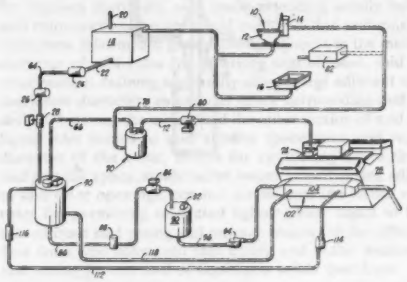
1. Filtration apparatus comprising an elongate tube, means for connecting said tube to a source of negative pressure, said tube having a plurality of tubular inlet passages formed integrally therewith and upstanding therefrom in spaced relationship therealong, each inlet passage terminating at its outer end in a female aperature, a plurality of hollow filtration paper holders for removable mounting in said female apertures, each holder having a lower male member and an upper end of ground glass constructed and arranged to support a filtration paper thereon, a plurality of liquid storage cylinders each having a ground glass lower portion for removable mounting on the upper end of one of said holders to form a liquid seal relative to a filtration paper mounted on said upper end of said holder, so that liquid in one or more of said storage cylinders may be withdrawn through a filtration paper, through a paper holder, and thence into said tube, clamping means con-

structed and arranged to maintain said liquid seal, and at least one filtrate collector for optional removable mounting between at least one of said upstanding inlets and an associated filtration paper holder, each said filtrate collector comprising a glass member constructed and arranged to trap a predetermined volume of the filtrate liquid after passing through said filtration paper holder, and having a lower male member for engaging said female aperture of one of said inlet passages and an upper female member for receiving the lower male member of one of said filtration paper holders, and having between the lower male member and upper female member a reservoir with an upstanding pierced outlet whereby liquid first entering said reservoir is stored therein and only overflows into said pierced outlet when the volume in said reservoir has reached a predetermined value, whereby said apparatus can be quickly and easily assembled with appropriate components and disassembled and cleaned thereafter.

3,956,126
APPARATUS FOR DISPOSING OF ORGANIC WASTE MATERIALS

Leale E. Streebin, 2301 Morgan Drive, and Namon A. Nassef, 800 Lexington Drive, No. 108, both of Norman, Okla. 73069

Filed July 20, 1973, Ser. No. 381,052
Int. Cl.² C02C *1/00*; F01N *3/02*
U.S. Cl. 210—104 **8 Claims**



1. Apparatus for disposing of water-containing waste materials comprising:

means for macerating the organic waste materials;

an evaporator unit for removing water from the waste materials;

means for conveying macerated organic waste materials to said evaporator unit;

heat exchange means for heating waste materials in the evaporator unit to remove water therefrom by elevating the temperature of the water above its boiling point;

an internal combustion engine having an intake manifold;

a condensing unit for condensing steam from said evaporator unit and connected to said intake manifold;

means for moving steam from said evaporator unit to said condensing unit;

a combustion chamber connected to said engine for receiving hot gases therefrom to incinerate organic solids therein;

means for conveying organic solids from the evaporator unit to said combustion chamber after water has been removed from the waste;

a heat exchange and combustion assembly including said combustion chamber for heating a non-aqueous heat exchange medium with heat generated upon combustion of organic solids in said combustion chamber; and

means for conveying said non-aqueous heat exchange medium from said assembly to said heat exchange means.

3,956,127
APPARATUS FOR ESTABLISHING CONTACT BETWEEN A LIQUID AND A GAS

Leif Holmberg, Dragor, Denmark, assignor to European Plastic Machinery MFG A/S, Kopenhamn, Denmark

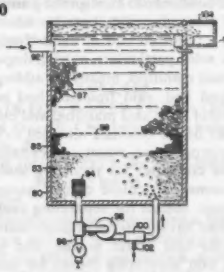
Continuation of Ser. No. 326,725, Jan. 26, 1973, abandoned. This application Aug. 5, 1974, Ser. No. 495,002
Claims priority, application Sweden, Jan. 26, 1972, 847/72
Int. Cl.² C02C *5/10*
U.S. Cl. 210—150 **1 Claim**

1. An apparatus for aeration of water poor in oxygen and for purification of water in a lake or a water course contaminated with organic matter, comprising a cylindrical container which is packed with hollow filling bodies and mounted for rotation about a horizontal axis, at least the circumferential wall of the cylindrical container being perforated so that the liquid and the gas can flow therethrough, the hollow filling bodies being of sufficiently light weight to support the cylindrical container when said container is partially immersed in the liquid, and a plurality of pipes parallel with the horizontal axis of the cylindrical container and symmetrically distributed about the circumferential wall of the cylindrical container, said pipes having openings of lesser size than the peripheral dimensions of the hollow filling bodies so as to prevent passage of said filling bodies through said openings into said pipes, said openings directed substantially in the direction of rotation of the cylindrical container for raising the liquid and for entraining air into the liquid.

3,956,128
APPARATUS FOR TREATING INDUSTRIAL AND DOMESTIC WASTE WATERS

Abner B. Turner, Greensburg, Pa., assignor to Degremont, S.A., Rueil-Malmaison, France

Continuation of Ser. No. 379,676, July 16, 1973, abandoned, which is a division of Ser. No. 281,076, Aug. 16, 1972, Pat. No. 3,774,768. This application Mar. 12, 1975, Ser. No. 557,888
Int. Cl.² C02C *1/04*; B01D *23/10*
U.S. Cl. 210—150 **4 Claims**



1. A system for treating industrial and domestic waste sewage, said system comprising:

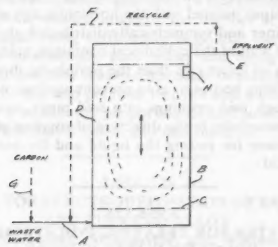
a tank;
a filter positioned in said tank;
an aerated packed column mounted above said filter in said tank, said column including a bacteria support media having a surface area of approximately 50 $ft.^2/ft.^3$;
inlet means for introducing into said tank screened sewage having suspended solids therein and for passing said sewage downwardly through said column and said filter;
effluent outlet means at the bottom of said tank for removing effluent from said tank;
by-pass passage means, including a pump, extending from said effluent outlet means to a lower portion of said tank for recirculating a portion of said effluent back into said tank;
means connected to said by-pass passage means for diffusing air into the recirculated effluent portion, for causing the air upon entry into said tank to separate in the form of small air bubbles from said recirculated effluent, and for forcing said air bubbles upwardly through said support media to provide oxygen to microorganisms growing on said support media which biologically remove the BOD loading in said sewage; and
means positioned on said tank for receiving and burning floc which rises to the surface of said tank from said support media.

3,956,129

WASTE TREATMENT APPARATUS

John S. Jeris, Yonkers; Carl Beer, Sand Lake, both of N.Y., and James A. Mueller, Teaneck, N.J., assignors to Ecolotrol, Inc., Bethpage, N.Y.

Division of Ser. No. 264,346, June 19, 1972, Pat. No. 3,846,289. This application Nov. 5, 1974, Ser. No. 521,200
Int. Cl.² C02C *1/04*
U.S. Cl. 210—189 **5 Claims**



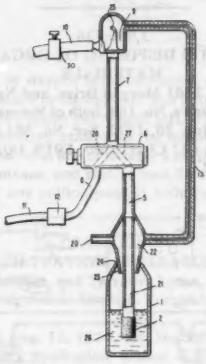
1. Apparatus for biologically denitrifying water containing oxidized nitrogen comprising an elongated, substantially vertically disposed container, a manifold disposed towards the bottom of said container to control the passage of water therethrough, inlet means for said container for receiving water to be processed, a fluidized bed of denitrifying microorganisms attached to a solid particulate carrier disposed in said container above said manifold, means for adding a carbon source to said fluidized bed, said fluidized bed being arranged to receive said water from said manifold and biologically convert substantially all of the oxidized nitrogen to be removed from the water to nitrogen gas, water and cellular material, outlet means for said container for receiving said processed water and at least some particulate carrier having excess cellular material thereon, means for separating said processed water from said carrier having excess cellular material in fluid communcation with said outlet means, and processing means connected to said separating means for receiving said separated carrier having excess cellular material and for effecting separation of said excess cellular material from said particulate carrier.

3,956,130

FILTERING APPARATUS

Robert F. Cunningham, Atlanta; Edward J. Walsh, Dunwoody; C. Samuel Graham, Stone Mountain; Willie D. Slayton, and Adrian Hailine, both of Atlanta, all of Ga., assignors to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Continuation-in-part of Ser. No. 186,283, Oct. 4, 1971, abandoned. This application June 27, 1974, Ser. No. 483,871
Int. Cl.² B01D *29/42*
U.S. Cl. 210—198 R **11 Claims**



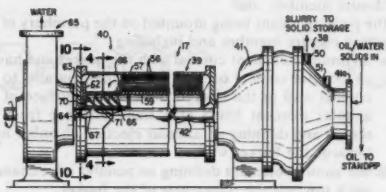
1. A device for filtering solids from solid-liquid mixtures and for dispensing aliquot portions of the filtrate, comprising:
container means for containing the solid-liquid mixture;
filter means, within said container means, for separating the liquid filtrate from a solid-liquid mixture;
air pressure means for introducing positive air pressure to the surface of the mixture within the container and for forcing the liquid filtrate through said filter means;
receiving means of defined volume, connected to one side of said filter means, for receiving and storing an accurately reproducible aliquot of the filtrate, said receiving means comprising a receptacle connected at the bottom to said filter means and open at the top;
delivery means for delivering the aliquot of the filtrate from said receiving means; and
a single valve means located at the bottom of said receptacle above said filter means for alternately controlling the flow of the filtrate first from the filter means to said receiving means while stopping the flow of the filtrate from said receiving means to said delivery means, and secondly from said receiving means to said delivery means while stopping the flow of the filtrate from said filter means to said receiving means,
whereby the valve means is first placed in the first position so that filtrate from the container is forced through said filter means into said receptacle until the filtrate overflows the receptacle, and then the valve means is placed in a second position so that no further filtrate can enter the receiving means and the aliquot of filtrate filling said receptacle above said valve means to the open top thereof is delivered therefrom by means of said delivery means.

3,956,131

SYSTEM FOR SEPARATION OF LIQUIDS AND SOLIDS FROM A CARRIER LIQUID

Andrew C. Harvey, Waltham, Mass., assignor to Foster-Miller Associates, Inc., Waltham, Mass.

Filed Mar. 6, 1974, Ser. No. 448,536
Int. Cl.² B01D *33/00*
U.S. Cl. 210—202 10 Claims



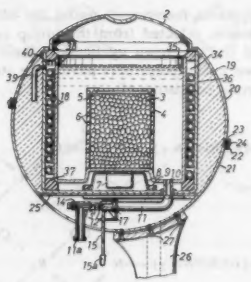
1. Apparatus for separating a lighter phase liquid and heavier solids from a carrier liquid effluent in which both said lighter phase liquid and solids are finely dispersed, comprising a hollow casing, a shaft rotatable about an axis in said casing, a shrouded rotor mounted upon said shaft having inner and outer sections, said rotor having a reduced diameter at a liquid inlet end thereof increasing in an axial and flow direction to a maximum diameter near the other end thereof, a plurality of generally parallel vanes mounted between said rotor sections for rotation therewith, said vanes extending axially between said rotor sections between said minimum and said maximum diameters, inlet means in said casing adjacent to the minimum diameter of said rotor for receiving said effluent, said outer rotor section defining a plurality of openings adjacent to said maximum diameter, an annular space surrounding said rotor defined between the casing and the outer section of said rotor, liquid inlet means to said annular space near said reduced diameter of the rotor, means for circulating liquid through said annular space, solids outlet means in said casing adjacent to said rotor openings, conduit means near the center of said rotor for permitting separated lighter phase liquid to be removed from said casing and passage means for the effluent to flow from said rotor into said casing and outlet means from said casing for removal of liquid and solids therefrom.

3,956,132

APPARATUS FOR PREPARING MINERAL WATER

Shiro Takemitsu, Osaka, Japan, assignor to Wakamizu Sangyo Kabushiki Kaisha, Osaka, Japan

Filed May 7, 1974, Ser. No. 467,724
Int. Cl.² B01D *11/00*
U.S. Cl. 210—219 1 Claim



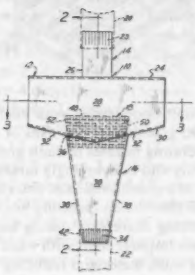
1. An apparatus for preparing mineral water from drinking water, comprising a container for reserving the drinking water, water, a mineral immersed in the water in the container to mineralize the water with metal ions, a high frequency generator means and a generator plate for causing the metal ions to dissolve out from the mineral at an accelerated rate, at least part of the mineral being in direct contact with the generator plate, the generator plate being in direct contact with the water and the generator means, and means for drawing off the mineral water from the container, wherein the contents has a double-wall construction, including an inner container and an outer container surrounding the peripheral side portion and bottom portion of the inner container, with a space formed between the inner and outer containers for reserving the water overflowing from the inner container, the mineral being immersed in the water within the inner container, and wherein said mineral is located within an enclosure in said inner container such that the generator plate directly contacts at least a portion of the enclosure.

3,956,133

CLEAN-OUT COUPLING FOR DOWNSPOUTS

George J. Arnold, 6665 Floyd, Detroit, Mich. 48210

Filed Nov. 11, 1974, Ser. No. 522,612
Int. Cl.² B01D *35/00*
U.S. Cl. 210—232 2 Claims



1. A trash intercepting clean-out coupling adapted to be installed between the vertically-spaced end portions of upper and lower downspout sections, said coupling comprising
- an upper inlet duct adapted to be fitted onto the lower end portion of the upper downspout section,
- a trash intercepting clean-out housing disposed below said inlet duct and having a wall structure defining a trash collection chamber,
- a lower outlet duct disposed below said trash intercepting clean-out housing and adapted to be fitted onto the upper end portion of the lower downspout section,
- and a screen disposed between said trash collection chamber and said outlet duct,
- said wall structure having an inlet opening communicating with said inlet duct and an outlet opening communicating with said outlet duct and a pair of trash removal access openings communicating with said chamber and disposed on opposite sides of said outlet duct in laterally-spaced relationship thereto.

3,956,134

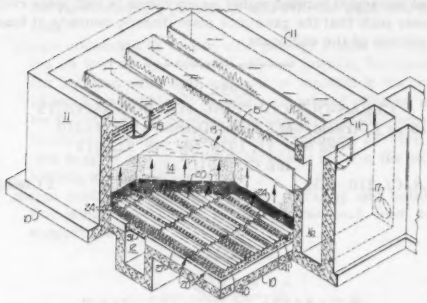
UNDERDRAIN FOR WATER FILTRATION SYSTEM

James Raymond Sturgill, Charlotte, N.C., assignor to Hi-Ran, Ltd., Charlotte, N.C.

Filed July 19, 1973, Ser. No. 380,988
Int. Cl.² B01D *23/18*
U.S. Cl. 210—275 35 Claims

1. A water filtration system comprising a filter basin having a supporting floor and side walls extending upwardly around the perimeter of the floor, an underdrain carried by said supporting floor and covering substantially the entire area thereof, and a bed of filter media positioned in said filter basin overlying said underdrain, said underdrain comprising a plu-

rality of elongate hollow underdrain units each having an elongate substantially horizontal fluid passageway therein, said underdrain units being arranged with their fluid passageways in fluid communication with each other and forming a network of horizontal fluid passageways beneath said bed of filter media, each underdrain unit having an upper wall along its length defining the upper portion of the elongate fluid passageway therein, and a plurality of nozzles provided in said upper wall with each of said nozzles defining a restricted fluid passageway extending along a substantially straight path through said upper wall and communicating with said elongate fluid passageway, most of said nozzles in the upper wall of



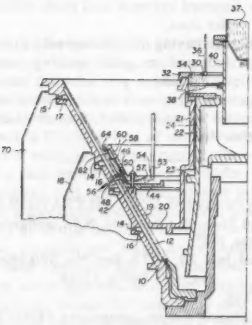
each underdrain unit cooperating with each other and being arranged in spaced groups with the axes of the fluid passageways of the cooperating nozzles in each group being oriented diagonally upwardly and convergingly intersecting each other in such a manner at a point outside of and closely adjacent the underdrain unit so that the cooperating nozzles direct streams of wash water issuing therefrom during backwashing diagonally upwardly into impingement with each other for dispersing the streams of wash water and reducing the force thereof, and the remaining nozzles of said plurality of nozzles in said upper wall being located to direct streams of wash water laterally of the underdrain unit.

3,956,135

CENTRIFUGAL DRIER WITH PURGING DEVICE

Andre Mercier, La Madeleine, France, assignor to Fives-Cail Babcock, Paris, France

Filed Oct. 2, 1974, Ser. No. 511,359
Claims priority, application France, Oct. 2, 1973, 73.35121
Int. Cl.² B01D *33/00*
U.S. Cl. 210—377 **11 Claims**



1. In a centrifugal drier which comprises a basket having a conical wall and defining an interior chamber having a lower part, the basket being rotatable about a vertical axis, a conical screen disposed on the conical basket wall, a conduit for feeding a solid-liquid mixture to the basket chamber, a layer of solid material being centrifugally deposited on the conical screen upon rotation of the basket, and a means for purging the layer of solid material, the improvement of

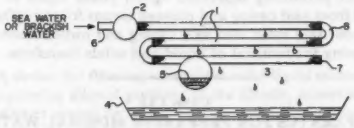
1. a rotary closure member mounted in the interior basket chamber and closing off the lower part of the interior basket chamber,
2. a fluid-tight joint between the feeding conduit and the closure member, and
3. the purging means being mounted on the periphery of the rotary closure member and including
   a. an annular element coaxial with the basket and having an exterior conical surface substantially parallel to the conical wall of the basket, the exterior surface of the annular element being at a small distance from the screen and defining an annular ejection chamber open towards the basket wall,
   b. the annular element defining an annular inlet chamber open towards the rotary axis of the basket,
   c. a narrow circular passage connecting the inlet chamber with the ejection chamber, and
   d. at least one fixed spray nozzle delivering a purging liquid to the annular inlet chamber.

3,956,136

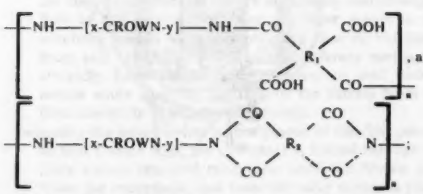
NITROGEN LINKED CYCLIC POLYETHER ION BINDING POLYMERIC LIQUID PURIFICATION MATERIALS

Lawrence W. Frost, Murrysville, Pa., assignor to Union Carbide Corporation, New York, N.Y.

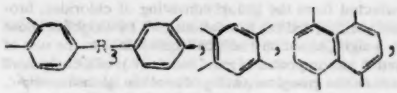
Filed Jan. 3, 1974, Ser. No. 430,452
Int. Cl.² B01D *31/00*
U.S. Cl. 210—500 M **9 Claims**

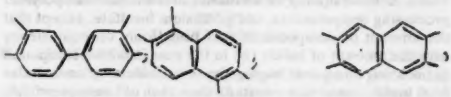


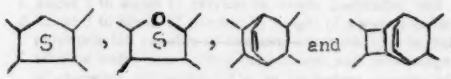
1. A polymeric membrane, useful for ultrafiltration and reverse osmosis, selected from the group consisting of polyamic acid linked crown cyclic polyethers and polyimide linked crown cyclic polyethers having the structure selected from the group consisting of:



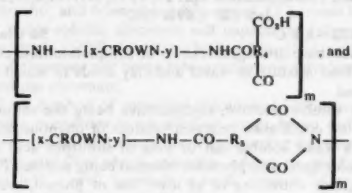
wherein *n* has a value of from about 5-100, R_1 and R_2 are at least one tetravalent organic radical, selected from the group consisting of:



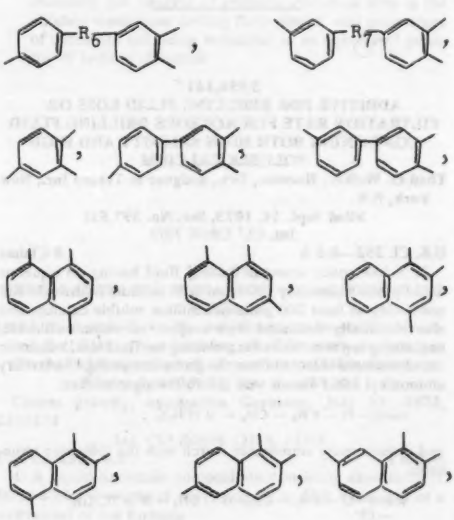


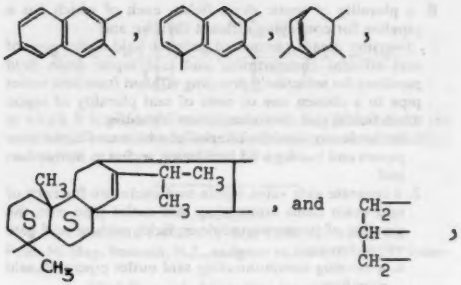


R_3 being selected from the group consisting of divalent aliphatic hydrocarbon radicals having from 1 to 4 carbon atoms and carbonyl, oxy, sulfo, and sulfonyl radicals; and



wherein *m* has a value of from about 5- 100, R_4 and R_5 are at least one trivalent organic radical, selected from the group consisting of:





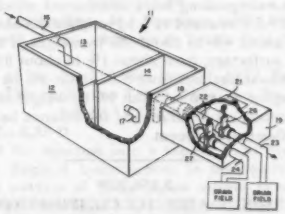
R_6 and R_7 being selected from the group consisting of divalent aliphatic hydrocarbon radicals having from 1 to 4 carbon atoms and carbonyl, oxy, sulfo, and sulfonyl radicals, and wherein the crown cyclic polyether constituent is an ion binding divalent radical represented as [x-CROWN-y], said crown cyclic polyether constituent being selected from the group consisting of 9-crown-3, 12-crown-4,15-crown-5, 18-crown-6, 21-crown-7,24-crown-8,dibenzo-12-crown-4, dibenzo 15-crown-5,dibenzo 18-crown-6,dibenzo-21-crown-7, dibenzo-24-crown-8,dibenzo-27-crown-9, dibenzo-30-crown-10, dicyclohexyl-12-crown-4,dicyclohexyl-15crown-5,dicyclohexyl-18-crown-6,dicyclohexyl-21-crown-7,dicyclohexyl-24-crown-8,dicyclohexyl-27-crown-9,dicyclohexyl-30-crown-10,benzo-9-crown-3,benzo-12-crown-4,benzo-15-crown-5,benzo-18-crown-6,cyclohexyl-9-crown-3,cyclohexyl-12-crown-4,cyclohexyl-15-crown-5 and cyclohexyl-18-crown-6 wherein *x* is the total number of carbon plus oxygen atoms making up the polyether ring, and *y* is the number of oxygen atoms on that ring and wherein the membrane is effective to electrically trap ions in applied contaminated liquid solutions.

3,956,137

SEWAGE SEPTIC SYSTEM FOR A PLURALITY OF DRAIN FIELDS

James G. Dempsey, Woodside, Calif., assignor to Langley Hill Quarry, Woodside, Calif.

Filed Dec. 6, 1973, Ser. No. 422,584
Int. Cl.² C02C *1/00*
U.S. Cl. 210—532 S **1 Claim**



1. A septic sewage system comprising:

A. a septic tank which supports a bacteriological action and includes:

1. a sewage settling compartment;
2. an effluent compartment communicating with said sewage settling compartment;
3. an inlet pipe communicating with said settling compartment for delivering raw sewage thereto; and
4. an outlet pipe communicating with said effluent compartment for discharging effluent therefrom;

B. a plurality of septic drain fields, each of which has a pipeline for conveying effluent thereto; and

C. diversion means connected between said outlet pipe of said effluent compartment and said septic drain field pipelines for selectively directing effluent from said outlet pipe to a chosen one or ones of said plurality of septic drain fields, said diversion means including:

1. an enclosure into the interior of which said outlet pipe passes and having a lid facilitating access to its interior; and

2. a separate gate valve within said enclosure for each of said drain fields connecting said outlet pipe with the pipeline of its associated drain field, each of said gate valves having:

a. a housing communicating said outlet pipe with said pipe line;

b. a gate within said housing movable between a closed position blocking flow from said outlet pipe to the drain field pipe line with which it is associated and an open retracted position permitting effluent flow from said outlet pipe through said pipe line; and

c. an actuator for moving said gate valve between said open and closed positions, said actuator including:

1. a rod which is drivingly secured at one end to said gate and extends in the direction of movement between said open and closed positions to a free end exteriorly of said valve housing; and

2. a handle secured to said free end of said rod for manually moving the same between said two positions;

whereby reciprocation of said rod actuates said valve between said open and closed positions, and the handle and the portion of said rod exterior of said housing constitutes by reason of their relative position to other gate valves in said enclosure means providing a visual indication of the open and closed position of the valve gate to which it is secured and thereby a visual indication of the drain field or fields to which the effluent is directed by said diversion means.

3,956,138

COMPOSITIONS OF FIRE-EXTINGUISHING FOAM CONCENTRATES AND METHOD OF USING THE SAME

Fred Benton Crockett, Rte. 3, Box 479E Dorwood Drive, Orlando, Fla. 32811

Filed Sept. 24, 1973, Ser. No. 399,915
Int. Cl.² A62D *1/00*

U.S. Cl. 252—3 **21 Claims**

1. A fire-extinguishing foam concentrate which comprises from about 7.5% to about 12% by weight of an anionic surfactant, from about 4% to about 9% by weight of a sulfonated amine salt surfactant, from about 1% to about 8% by weight of a nonionic surfactant, from 0 to about 5% by weight of a lipophilic agent, from 0 to about 9% by weight of an alkoxylated ammonium alkyl sulfate and the balance being substantially non-flammable diluent.

3,956,139

SYNERGISTIC ADDITIVE COMBINATIONS FOR FLAME-RETARDING POLYMERS

William Paul Whelan, Jr., Woodbury, Conn., assignor to Uniroyal Inc., New York, N.Y.

Filed Sept. 12, 1973, Ser. No. 396,632
Int. Cl.² C09K *3/28*

U.S. Cl. 252—8.1 **19 Claims**

1. A flame retardant composition comprising: (a) a compound selected from the group consisting of the oxides, sulfates, carbonates, acetylacetonates, and carboxylates of iron, cobalt, nickel, tin and antimony and the bis-cyclopentadienyl compounds of iron, cobalt and nickel, said carboxylates being the salts of an acid selected from the group consisting of acetic, oxalic, tartaric and citric acids; and (b) an alkali metal halide selected from the group consisting of chlorides, bromides and iodides; and (c) from about 25% by weight to about 325% by weight, based on chemical equivalency to the sum of the amounts of compound (a) and halide (b), of a compound selected from the group consisting of succinic, glutaric, adipic, pimelic, suberic, tartaric, m-phthalic and citric acids, mono- and dialkyl phosphonic and phosphoric acids, organic sulfonic acids having an acid ionization constant in excess of 10^{-6} and which is substantially non-volatile at conventional polymer processing temperatures, and potassium bisulfate, except that the amount of component (c) is based only on equivalency with the amount of halide (b) in the case in which compound (a) is a salt of an acid having the same ionization constant as or a higher ionization constant than that of component (c); compound (a) being present in an amount which is about 5 to about 100% by weight of the amount chemically equivalent to the halogen atoms present.

3,956,140

DRILLING FLUIDS

James Jang Woo Nahm, and David A. Rowe, both of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 60,637, Aug. 3, 1970, abandoned. This application Apr. 27, 1973, Ser. No. 355,153
Int. Cl.² C09K *7/02*

U.S. Cl. 252—8.5 C **56 Claims**

1. A water base drilling, workover or completion fluid comprising a base mixture of water and clay solids to which has been added

a water soluble additive, said additive being the sulfomethylated condensate reaction product of phenolic material, a water soluble salt or salts of sulfurous acid and formaldehyde, said phenolic material being selected from the group consisting of at least one of phenol, cresol, xylenol, tar acid and "phenol bottoms"; said additive being present in a small but effective amount sufficient to reduce the fluid loss of said base mixture.

3,956,141

ADDITIVE FOR REDUCING FLUID LOSS OR FILTRATION RATE FOR AQUEOUS DRILLING FLUID CONTAINING BOTH HIGH SALINITY AND HIGH SOLUBLE CALCIUM

Thad O. Walker, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Sept. 14, 1973, Ser. No. 397,531
Int. Cl.² C09K *7/02*

U.S. Cl. 252—8.5 A **8 Claims**

1. A low solids aqueous drilling fluid having an aqueous liquid phase essentially saturated with calcium hydroxide and containing at least 200 parts per million soluble calcium and also essentially saturated with respect to sodium chloride, containing as the additive for reducing the fluid loss, a cationic starch material selected from the group consisting of a tertiary aminoalkyl ether starch with the following structure:

$$\text{starch}—O—CH_2—CH_2—N(CH_3)_2$$

and a quaternary ammonium starch with the following structure:

$$\text{starch}—O—CH_2—CH_2—O—CH_2—N^+—(CH_3)_3 \; Cl^-.$$

3,956,142

NONCORRODING WATER BASE DRILLING FLUIDS AND ADDITIVE SYSTEM FOR MAKING

Doyne L. Wilson; Warren C. McMordie, Jr., and Albert H. D. Alexander, all of Houston, Tex., assignors to Oil Base, Inc., Houston, Tex.

Continuation of Ser. No. 186,452, Oct. 4, 1971, abandoned, which is a continuation-in-part of Ser. No. 772,821, Nov. 1, 1968, abandoned. This application Oct. 16, 1972, Ser. No. 297,770

Int. Cl.² C09K 7/00

U.S. Cl. 252—8.5 C 12 Claims

1. A non-lignosulfonate-containing thinning and gel forming additive system for use in an alkaline water base drilling fluid which consists essentially of, in combination:

a. about 40 to about 60 percent by weight of a watersoluble alkali metal lignin;

b. about 20 to about 47 percent by weight of lignite;

c. about 3 to about 15 percent by weight quebracho; and

d. about 3 to about 15 percent by weight of a watersoluble chromate salt capable of releasing chromate ions in the alkaline water base drilling fluid system, said percentage of chromate salt measured as an equivalent quantity of sodium chromate.

5. An alkaline water base drilling fluid containing water, a hydratable clay, a weighting agent, and a non-lignosulfonate-containing thinning and gel forming additive system consisting essentially of from about 40 to about 60 percent by weight of an alkali metal lignin, from about 20 to about 47 percent by weight lignite, from about 3 to about 15 percent by weight quebracho, and from about 3 to about 15 percent by weight of a water-soluble chromate salt capable of releasing chromate ions in the alkaline water base drilling fluid, said percentage of chromate salt being measured as an equivalent quantity of sodium chromate.

12. A method of restoring rheological properties and gel forming properties to an alkaline water based drilling fluid under conditions of use without introducing corrosive materials into said fluid which comprises adding to said fluid circulating into a well borehole a small amount of an additive system consisting essentially of:

a. about 40 to about 60 percent by weight of a water soluble alkali metal lignin;

b. about 20 to about 47 percent by weight of lignite;

c. about 3 to about 15 percent by weight quebracho; and

d. about 3 to about 15 percent by weight of a water-soluble chromate salt capable of releasing chromate ions in the alkaline water base drilling fluid system, said percentage of chromate salt being measured as an equivalent quantity of sodium chromate.

3,956,143

PREPARATION FOR THE ANTISTATIC FINISHING OF FIBERS

Ulrich Cuntze, Hofheim, Taunus; Gustav Dollinger, Egelsbach, and Rolf Kleber, Neu-Isenburg, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

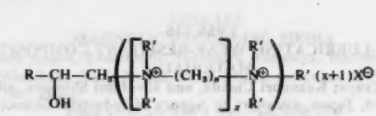
Filed July 10, 1974, Ser. No. 487,313

Claims priority, application Germany, July 13, 1973, 2335674

Int. Cl.² D06M 13/36, 13/46

U.S. Cl. 252—8.8 1 Claim

1. A liquid antistatic composition consisting essentially of 50 to 80% by weight of water and 20 to 50% by weight of a compound of the formula



in which R is alkyl of 6 to 16 carbon atoms, R′ stands for the same or different lower alkyls, X is chloride, lower alkylsulfate or tosylate, *n* is 2 or 3 and *x* is 1,2 or 3.

3,956,144

FLAME-RETARDANT SOFTENING AGENTS

Peter M. Hay, Summit, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Sept. 16, 1974, Ser. No. 506,234

The portion of the term of this patent subsequent to May 25, 1993, has been disclaimed.

Int. Cl.² D06M 13/26

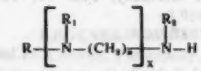
U.S. Cl. 252—8.8 18 Claims

1. A textile softening agent produced by reacting

A. the phosphate compound of the formula:

$$(BrCH_2\text{–}CHBrCH_2O)_3PO$$

with B. a compound of the formula:



or a mixture thereof,

wherein

R is a monovalent aliphatic hydrocarbon radical containing 10 to 24 carbon atoms,

R_1 and R_2 are independently hydrogen, lower alkyl of 1 to 4 carbon atoms, or hydroxyalkyl of 2 to 3 carbon atoms,

n is 2 or 3, and

x is 0, 1, or 2,

said reactant B and said phosphate compound being reacted in a weight ratio of from 10:1 to 1:1 at a temperature between 30°C. and 150°C. for a period of time between 2 minutes and 12 hours.

3,956,145

FLUID FOR INJECTION INTO A SUBTERRANEAN RESERVOIR TO DISPLACE HYDROCARBONS IN THE RESERVOIR

Charles A. Christopher, Jr., Houston, and Abdus Satter, Conroe, both of Tex., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 319,067, Dec. 27, 1972, Pat. No. 3,818,989. This application Feb. 6, 1974, Ser. No. 440,116

Int. Cl.² E21B 43/22

U.S. Cl. 252—8.55 D 4 Claims

1. A fluid for injection into a subterranean hydrocarbon reservoir to displace hydrocarbons in the reservoir which comprises a mixture of hydrocarbon solvent in an amount sufficient to provide miscibility with hydrocarbons contacted in the reservoir, an amount of colloidal silica having a particle size ranging from about 7 to 15 millimicrons and a surface area of from about 50 to about 400 meters²/gram sufficient to thicken the solvent, water in an amount sufficient to emulsify the hydrocarbon solvent and a high molecular weight polymer selected from the group consisting of polyarylamides, polysaccharides produced by the bacterium *Xanthomonas campestris*, water soluble starch derivatives containing carboxyl, sulfonate or sulfate group, polyvinyl alcohol, polyvinyl pyrrolidone, poly (arylic acid)$_c$ poly (ethylene oxide) and polyethyleneimines in an amount sufficient to migrate from the mixture into the water present in the reservoir and reduce permeability of the reservoir to water.

3,956,146

SELF-LUBRICATING WEAR-RESISTANT COMPOSITE MATERIALS

Yuko Tsuya; Kazunori Umeda, and Hirofumi Shimura, all of Tokyo, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed July 18, 1974, Ser. No. 489,758
Claims priority, application Japan, July 20, 1973, 48-81904
Int. Cl.² C10M 5/00, 7/00
U.S. Cl. 252—12 4 Claims

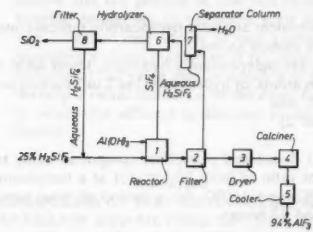
1. A self-lubricating wear-resistant composite material consisting essentially of tungsten disulfide dispersed in a matrix formed by the sintering reaction at 800° to 1000°C. of a molded compression blend of molybdenum disulfide with a matrix metal selected from the group consisting of copper, copper alloy and nickel, said tungsten disulfide being dispersed in the resultant composite material as a lubricant.

3,956,147

PRODUCTION OF METAL FLUORIDES FROM FLUOSILICIC ACID

Wolf Becker, Cologne; Heinz Jonas, Opladen, and Wolfgang Weiss, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Jan. 28, 1974, Ser. No. 437,133
Claims priority, application Germany, Feb. 17, 1973, 2307925
Int. Cl.² C01B 9/08
U.S. Cl. 423—19 3 Claims



1. A process which comprises heating a metal oxide, hydroxide or mixture thereof wherein the metal is selected from the group consisting of aluminum, calcium, chromium and uranium in aqueous fluosilicic acid, to about 140° to 240°C at a pressure of from 5 to 30 atmospheres gauge, said fluosilicic acid having a concentration of about 10 to 45% by weight and being present in a 1 to 20% stoichiometric excess, based on the metal oxide, hydroxide or mixture thereof, whereby silicon tetrafluoride is removed from said fluosilicic acid in gaseous form and the remaining hydrogen fluoride in said aqueous solution forms the corresponding metal fluoride and recovering said metal fluoride from the reaction mixture.

3,956,148

LUBRICATING OIL COMPOSITIONS

Joseph Marian Swietlik, Reading, and Michael David Sexton, Oxford, both of England, assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Mar. 5, 1975, Ser. No. 555,362
Claims priority, application United Kingdom, Mar. 13, 1974, 11157/74
Int. Cl.² C10M 1/38, 3/32, 1/32, 3/26
U.S. Cl. 252—47.5 9 Claims

1. A lubricating oil composition comprising a lubricating oil and the product derived from the reaction of (1) hexamethylene tetramine with (2) a phenol, a methylene bis-phenol or a sulphurised phenol provided that in said phenol, methylene bis-phenol or sulphurised phenol at least one of the 2,4 and 6 positions of the phenol aromatic ring is unsubstituted and wherein the molar ratio of (1) to (2) is from 1:10 to 2:1.

3,956,149

NITROGEN-CONTAINING ESTERS AND LUBRICANTS CONTAINING SAME

Lester E. Coleman, Willoughby Hills, Ohio, assignor to The Lubrizol Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 843,180, July 18, 1969, abandoned. This application Oct. 6, 1971, Ser. No. 187,129
The portion of the term of this patent subsequent to May 25, 1993, has been disclaimed.
Int. Cl.² C10M 1/32
U.S. Cl. 252—51.5 A 20 Claims

1. A lubricant or fuel composition comprising a major proportion of a lubricating oil or a normally liquid fuel and a minor proportion of an additive sufficient to impart viscosity index and dispersant properties to the composition, said additive being a nitrogen-containing ester of a carboxy-interpolymer having a reduced specific viscosity ranging from about 0.05 to about 2.0, said interpolymer being derived from the interpolymerization of at least one monomer selected from the group consisting of aliphatic olefins having from 2 to about 8 aliphatic carbon atoms and styrene, and at least one monomer selected from the group consisting of an α,β-unsaturated aliphatic carboxylic acid, the anhydride or an ester thereof; and said interpolymer having (A) pendant carboxylic-ester groups derived from the esterification of the carboxy groups of the interpolymer with at least one high molecular weight alcohol having at least 7 aliphatic carbon atoms, and (B) pendant carbonylpolyamino groups derived from the reaction of the carboxy groups of the interpolymer with hydrazine or a hydrocarbon-substituted hydrazine; wherein the molar ratio of (A):(B) is in the range of from about 2:1 to about 50:1.

14. A lubricant or fuel composition comprising a major proportion of lubricating oil or normally liquid fuel and a minor proportion of an additive sufficient to impart viscosity index and dispersant properties to the composition, said additive being a nitrogen-containing ester of a styrene-maleic acid interpolymer having a reduced specific viscosity ranging from about 0.05 to about 2.0, the interpolymer being substantially free of carboxylic-acid groups and having (A) pendant carboxylic-ester groups derived from the esterification of the carboxy groups of the interpolymer with at least one high molecular weight alcohol having from 7 to about 24 carbon atoms, and (B) pendant carbonylpolyamino groups derived from the reaction of the carboxy groups of the interpolymer with hydrazine or a hydrocarbon-substituted hydrazine; wherein the molar ratio of (A):(B) is in the range of from about 2:1 to about 50:1, and the carboxylic-acid groups are present in the range of from about 0 to 2 molar percent.

18. A lubricant or fuel composition comprising a major proportion of lubricating oil or normally liquid fuel and from about 0.001% to about 25% by weight of a nitrogen-containing ester of a styrene-maleic acid interpolymer having a reduced specific viscosity ranging from about 0.05 to about 2.0, the interpolymer having (A) pendant carboxylic-ester groups derived from the esterification of the carboxy groups of the interpolymer with at least one alcohol having from 7 to about 24 aliphatic carbon atoms, and (B) pendant carbonylpolyamino groups derived from the reaction of the carboxy groups of the interpolymer with hydrazine or a hydrocarbon-substituted hydrazine; wherein the molar ratio of (A):(B) is in the range of from about 3:1 to about 20:1.

3,956,150

METHOD OF PREPARING FERROELECTRIC CERAMICS

Hiromu Ouchi, Toyonaka; Masamitsu Nishida, Osaka, and Kazunori Numata, Moriguchi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Nov. 18, 1974, Ser. No. 524,940

Claims priority, application Japan, Nov. 24, 1973, 48-132360

Int. Cl.² C04B 35/46, 35/48

U.S. Cl. 252—62.9 6 Claims

1. A method of preparing ferroelectric ceramics selected from the group consisting of:

I Pb $([B_1]_A Nb_{1-A})O_3$-$PbTiO_3$-$PbZrO_3$, where $[B_1]$ is one member selected from the group consisting of Mg, Zn, Cd, Sn, Mn, Fe, Co and Ni when A=⅓, and $[B_1]$ is one member selected from the group consisting of Li and Cu when A=¼,

II. Pb $([B_2]_B Nb_{1-B})O_3$-$Pb([B_3]_C Nb_{1-C})O_3$-$PbTiO_3$-$PbZrO_3$, where each of $[B_2]$ and $[B_3]$, $[B_2] \neq [B_3]$, is one member selected from the group consisting of Mg, Zn, Cd, Sn, Mn, Fe, Co and Ni when B and C=⅓, and each of $[B_2]$ and $[B_3]$, $[B_2] \neq [B_3]$, is one member selected from the group consisting of Li and Cu when B and C=¼,

III. Pb $([B_1]_A Nb_{1-A})O_3$-$PbTiO_3$-$PbZrO_3$ with MnO_2, where $[B_1]$ is one member selected from the group consisting of Mg, Zn, Cd, Sn, Fe, Co and Ni when A=⅓, and $[B_1]$ is one member selected from the group consisting of Li and Cu when A=¼, and

IV. $Pb([B_2]_B Nb_{1-B})O_3$-$Pb([B_3]_C Nb_{1-C})O_3$-$PbTiO_3$-$PbZrO_3$ with MnO_2, where each of $[B_2]$ and $[B_3]$, $[B_2] \neq B_3]$, is one member selected from the group consisting of Mg, Zn, Cd, Sn, Fe, Co and Ni when B and C=⅓, and each of $[B_2]$ and $[B_3]$, $[B_2] \neq [B_3]$, is one member selected from the group consisting of Li and Cu when B and C=¼,

said method comprising: calcining at 700° to 900°C a powdered mixture of the oxides, hydroxides or carbonates of the metals to be contained in the ceramics to form a solid solution and then sintering at 1200° to 1300°C, then heat treating at a temperature lower by about 100°C to about 400°C than the sintering temperature, maintaining said heat treating for from about 1 hour to about 60 hours, and then cooling the material subjected to said heat treatment at a cooling rate from about 300°C per hour to about 10°C per hour, so as to increase the tensile strength and decrease the resonant impedance of said ceramics.

3,956,151

METHOD FOR PRODUCING A FERROMAGNETIC CHROMIUM OXIDE

Tadashi Kawamata, Katana; Eiichi Hirota, Hirakata, and Yukio Terada, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed July 22, 1974, Ser. No. 490,703

Claims priority, application Japan, July 24, 1973, 48-83408

Int. Cl.² C01G 37/02; C04B 35/12

U.S. Cl. 252—62.51 18 Claims

1. A method for producing a ferromagnetic chromium dioxide, comprising: preparing a mixture including chromium trioxide and a hydrogen peroxide solution including H_2O_2 of more than 0.05 weight percent based on the weight of said chromium trioxide; heating said mixture in an air atmosphere at a pressure of 0.01 to 10 atmospheres and a temperature of 200° to 600°C for 1 minute to 5 hours; and cooling the thus heated mixture to room temperature.

3,956,152

MAGNETIC RECORDING MEDIA

Seiich Asada, Kokubunji; Masahiro Amemiya, Hachioji, and Michiharu Seki, Fuchu, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 23, 1973, Ser. No. 408,670

Claims priority, application Japan, Mar. 16, 1973, 48-30100; Mar. 7, 1973, 48-26110; Oct. 23, 1972, 47-105300

Int. Cl.² C01G 37/02

U.S. Cl. 252—62.51 5 Claims

1. A magnetic recording medium comprising a composition of ferromagnetic chromium dioxide containing about 0.4 to about 8 weight percent of tungsten, based on the weight of chromium dioxide, and an effective amount of at least one member selected from the group consisting of copper and zinc to improve the intrinsic coercive force of the tungsten modified ferromagnetic chromium dioxide.

3,956,153

REGENERATIVE NUCLEATING AGENTS

Desh D. Chadha, Parsippany, N.J., assignor to Bio-Medical Sciences, Inc., Fairfield, N.J.

Filed Sept. 26, 1973, Ser. No. 401,040

Int. Cl.² C09K 5/00, 3/00

U.S. Cl. 252—67 7 Claims

1. In a material which is thermally responsive to a reversible change in phase from liquid to solid the method of minimizing undercooling in the course of transformation of said material from the liquid to solid phase which comprises incorporating in said material a chemically inert nucleating substance which is soluble but sparingly so in said thermally responsive material at said phase transformation temperature, said substance having at least one a/b, a/c, or c/b unit cell ratio and a space group substantially identical with said material but a melting point significantly higher than the temperature at which said phase transformation occurs, the amount of said substance being incorporated being in excess of the amount which will dissolve in said material at both said phase transformation temperature and at a higher preselected, normally encountered temperature and being about 0.1 to about 50 percent by weight of said material.

4. A composition of matter comprising: (a) a thermally responsive material wherein said thermally responsive material is a solid solution selected from the group consisting of o-chloronitrobenzene: o-bromonitrobenzene; **l-menthol:** dl-menthol; acetophenone: benzophenone; dimethyl-succinate: dimethyloxalate; 4-chloropropiophenole:4-bromopropiophenone; 4-chloro-2-methylaniline: 4-bromo-2-methylaniline: 4-chloroacetophenone: 4-bromoacetophenone; n-butylsulfoxide: n-butylsulfone; n-hexane; 2 nondecane; and alpha-bromocinnamaldehyde, alpha-chlorocinnamaldehyde: and (b) a chemically inert nucleating substance which is soluble but sparingly so in said thermally responsive material at said phase transformation temperature, said substance having at least one a/b, a/c, or c/b unit cell ratio and a space group substantially identical with said material but a melting point significantly higher than the temperature at which said phase transformation occurs, the amount of said substance being incorporated being in excess of the amount which will dissolve in said material at both said phase transformation temperature and at a higher preselected, normally encountered temperature and being about 0.1 to about 50 percent by weight of said material.

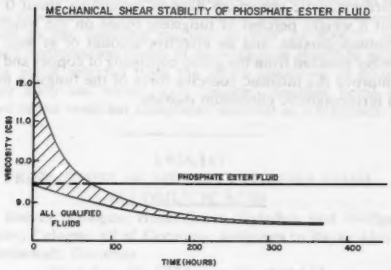
7. The composition of claim 4 wherein the nucleating substance is anthraquinone.

3,956,154

HYDRAULIC FLUID SYSTEM

Theodore A. Marolewski, New City, and Peter E. Timony, Valley Cottage, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Feb. 11, 1974, Ser. No. 441,701
Int. Cl.² C09K 3/00; C10M 3/40
U.S. Cl. 252—78 20 Claims



1. A functional fluid composition comprising a mixture of:
1. A base stock material selected from the group consisting of esters of an acid of phosphorus, amides of an acid of phosphorus, mineral oil, synthetic hydrocarbon oil, hydrocarbyl silicates, silicones, aromatic ethers, thioether compounds, chlorinated biphenyls, monoesters, esters of dicarboxylic acids and monohydric alcohols, esters of monocarboxylic acids and polyhydric alcohols, and mixtures thereof; and
2. A low molecular weight polyester of a C_2–C_{18} dicarboxylic acid and a C_2–C_{18} diol wherein said polyester is present in an amount ranging from about 3 to about 15% by weight and has a molecular weight varying from about 2,000 to about 5,000.

17. A method for controlling shear stability in an aircraft hydraulic fluid comprising a base stock selected from the group consisting of esters of an acid of phosphorus, amides of an acid of phosphorus, mineral oils, synthetic hydrocarbon oils and mixtures thereof which comprises incorporating in said hydraulic fluid from between about 1 to about 20 percent by weight of a low molecular weight polyester of a C_2–C_{18} dicarboxylic acid and a C_2–C_{18} diol.

3,956,155

TEXTILE FIBROUS CLEANING STRUCTURES

Milan Johann Schwuger, Monheim, Germany, assignor to Henkel & Cie G.m.b.H., Dusseldorf, Germany

Filed Nov. 23, 1973, Ser. No. 418,689
Claims priority, application Germany, Dec. 2, 1972, 2259138
Int. Cl.² C11D 17/00
U.S. Cl. 252—91 13 Claims

1. A textile fibrous structure impregnated with nonionic surface-active agent and suitable for cleaning purposes comprising a water-insoluble high polymer textile fibrous structure having a content of salt-forming carboxyl groups in such an amount that there is at least 1 mVal of salt-forming carboxyl groups per gram of said structure, and said carboxyl groups being present substantially as a salt selected from the group consisting of an alkali metal salt, an ammonium salt, a salt of an organic ammonium base, and mixtures thereof, said structure containing from 0.05% to 20% of its weight of an impregnant comprising at least one water-soluble nonionic polyalkoxylated surface-active agent having a turbidity point below 80°C.

3,956,156

CLEANSING OF FABRICS

Arthur Norman Osband, New Brunswick; Frederick William Gray, Summit, and Jon C. Jervert, Piscataway, all of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Apr. 28, 1971, Ser. No. 138,375
Int. Cl.² C11D 3/395, 7/54
U.S. Cl. 252—95 7 Claims

1. Process of removing stains from fabrics which comprises immersing said fabrics into water containing from about 0.15 to 0.5% of a composition of (a) a peroxygen compound selected from the group consisting of urea-hydrogen peroxide and sodium perborate, sodium percarbonate, and sodium perborate monohydrate and their corresponding calcium, magnesium, potassium and hydrogen salts, (b) an activator capable of forming a peracid on reaction with the peroxygen compound, the mol ratio of activator to active oxygen from the peroxygen compound being 2:1 to 1:60 and (c) 10 to 60% by weight of an alkali metal or alkaline earth metal citrate.

3,956,157

DETERGENT AND BLEACHING AGENT COMPRISING SODIUM PERBORATE AND SODIUM α-GLUCOHEPTONATE AND SODIUM β-GLUCOHEPTONATE

Nelson S. Marans, Silver Spring, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed July 19, 1974, Ser. No. 490,120
Int. Cl.² C11D 3/395
U.S. Cl. 252—95 7 Claims

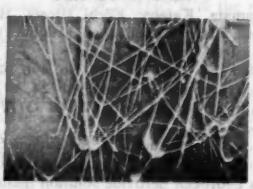
1. A substantially free flowing particulate solid composition useful as a detergent and bleach prepared by a process consisting essentially of:
a. admixing;
   i. a first mixture consisting essentially of substantially equal molar amounts of sodium α-glucoheptonate and sodium β-glucoheptonate;
   ii. sodium perborate; and
   iii. an amount of water effective for dissolving the sodium glucoheptonates and the sodium perborate to form a second mixture;
b. agitating the second mixture to dissolve the glucoheptonates and the sodium perborate to form the aqueous solution; and
c. evaporating water from the aqueous solution to form the substantially free flowing particulate solid composition.

3,956,158

POURABLE LIQUID COMPOSITIONS

Robert Donaldson, Wirral, England, assignor to Lever Brothers Company, New York, N.Y.

Filed Jan. 16, 1974, Ser. No. 433,949
Claims priority, application United Kingdom, Jan. 7, 1974, 675/74
Int. Cl.² C11D 7/54
U.S. Cl. 252—102 20 Claims



1. A pourable liquid composition having a yield stress value at 20°C of from 1 to 21 dynes/cm², comprising an aqueous medium having a viscosity at 20°C of from 1 to 60 poise at a

shear rate of 7 sec^{-1}, containing a three-dimensional network of insoluble entangled filaments having a diameter of from 0.1 to 100μ and a length to diameter ratio of at least 60, and particulate solid dispersed in the medium and prevented from separating from the medium by the filament network.

3,956,159

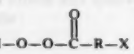
STABLE CONCENTRATED LIQUID PEROXYGEN BLEACH COMPOSITION

John Paul Jones, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 25, 1974, Ser. No. 526,751
Int. Cl.² C11D *7/50, 7/56*
U.S. Cl. 252—104 **4 Claims**

1. A storage stabilized concentrated liquid peroxyacid bleach composition, consisting essentially of:

a. from about 94% to about 98% by weight of an anhydrous ternary solvent mixture consisting essentially of:
   i. from 20% to 45% by weight of t-butyl alcohol;
   ii. from 20% to 40% by weight of ethylene diacetate;
   iii. from 20% to 40% by weight of glycerol triacetate;
b. from about 1% to about 6% by weight of a peroxyacid having the formula



wherein R is an alkylene group containing from 1 to about 12 carbon atoms and X is methyl, chloromethyl, carboxyl, sulfonate or peroxycarboxylate and the water-soluble salts thereof;

c. from 0.005% to 0.05% by weight of a stabilizing agent selected from the group consisting of picolinic acid, dipicolinic acid, and quinaldic acid; and
d. from 0% to 3% by weight of a pH 6.5 to pH 12 buffering agent selected from the group consisting of phosphates, carbonates and bicarbonates.

3,956,160

HEAVY DUTY DETERGENT POWDER AND PROCESS FOR PRODUCTION OF THE SAME

Yutaka Watanabe, and Hiroshi Ueno, both of Kyoto, Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

Filed Dec. 12, 1973, Ser. No. 424,028
Claims priority, application Japan, Dec. 12, 1972, 47-124592
Int. Cl.² C11D *9/02, 9/12, 10/04, 13/20*
U.S. Cl. 252—132 **11 Claims**

1. A process for producing a heavy duty detergent powder which comprises neutralizing a fatty acid with a powdered hydrous sodium carbonate which has a moisture content of from about 5 to 20% by weight at a temperature higher than the melting point of said fatty acid, said temperature ranging from about 80°C to 100°C; the amount of powdered hydrous sodium carbonate ranging from 1 to 1.5 moles per 1 mole of fatty acid; and said neutralizing being completed in a time period of from about 20 to about 60 seconds.

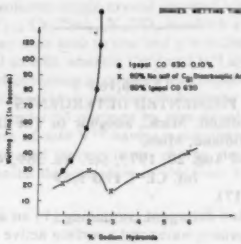
4. A process for producing a heavy duty detergent powder which comprises neutralizing a fatty acid having dissolved therein at least one non-ionic surface active agent with a powdered hydrous sodium carbonate which has a moisture content of from about 5 to 20% by weight at a temperature higher than the melting point of said fatty acid to prepare a soap, said temperature ranging from about 80°C to 100°C; said non-ionic surface active agent being present in an amount such that said non-ionic surface active agent comprises about 3 to 30% by weight based on the weight of the pure soap; the amount of powdered hydrous sodium carbonate ranging from 1 to 1.5 moles per 1 mole of fatty acid; and said neutralizing being completed in a time period of from about 20 about 60 seconds.

3,956,161

CLEANING COMPOSITIONS CONTAINING C_{21} DICARBOXYLIC ACID

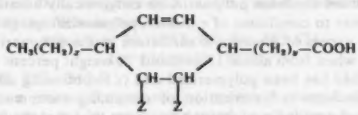
Fred E. Woodward, West Palm Beach, Fla., assignor to Westvaco Corporation, New York, N.Y.

Filed June 3, 1974, Ser. No. 476,042
Int. Cl.² C11D *10/02*
U.S. Cl. 252—156 **6 Claims**



1. A clear, water soluble, biodegradable alkaline cleaning solution consisting essentially of:

a. a salt of a C_{21} dicarboxylic acid of the formula



wherein x and y are integers from 3 to 9, x and y together equal 12, where one Z is hydrogen and the other Z is a carboxylic acid group, the primary carboxylic acid group has a pKa of 6.4, and the secondary carboxylic acid group has a pKa of 7.15, and a base selected from the group consisting of sodium hydroxide, potassium hydroxide and ammonium hydroxide in an amount of 10 to 30%, and

b. a nonionic surfactant, said nonionic surfactant and salt being in a weight ratio of from about 20:1 to 1:20, and whereby the C_{21} dicarboxylic acid salt solubilizes the nonionic surfactant.

3,956,162

THIXOTROPIC CLEANING COMPOSITION CONTAINING PARTICULATE RESINS AND FUMED SILICA

William Jacob Lautenberger, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed June 15, 1973, Ser. No. 370,284
Int. Cl.² C09K *3/22;* **C11D** *3/44*
U.S. Cl. 252—162 **7 Claims**

1. A thixotropic cleaning paste consisting essentially of

1. 10 to 40 parts of insoluble, synthetic, organic, polymeric, particulate matter selected from the group consisting of polystyrene, urea-formaldehyde resins, polyvinyl chloride, polyacrylics, polyethylene, polypropylene, and polyacrylonitrile-butadiene-styrene terpolymer having a particle size of from 10 to 105 microns and an oil value of at least 90;
2. 60 to 90 parts of a liquid component comprising

a. 5 to 20 parts of water,
b. 1 to 10 parts of a petroleum distillate high-boiler having a boiling point between about 150° and 250°C., and
c. 40 to 70 parts of a hydrocarbon or halogenated hydrocarbon low-boiling solvent having a boiling point of from about 35° to 75°C.;

3. 0.1 to 2.0 parts of a powdered solid fumed silica thixotropic agent having a particle size of from about 0.007 to 0.05 micron;

4. 0.01 to 5.0 parts of an emulsifying surfactant selected from anionic and non-ionic surfactants having a Hydrophile-Lipophile balance greater than 8.0; and
5. Up to 7.0 parts of a freeze-depressant solvent selected from the group consisting of methanol, ethylene glycol and their mixtures; and an inhibitor solvent selected from secondary butyl alcohol, tetrahydrofuran, dioxane and their mixtures.

3,956,163

PIGMENTED DETERGENTS

Do Ik Lee, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 20, 1973, Ser. No. 389,746

Int. Cl.² C11D 1/83

U.S. Cl. 252—171 **10 Claims**

1. A pigmented detergent containing (1) an aqueous liquid detergent comprising water and a surface active agent and (2) an opacifying amount of a non-film forming water- and detergent-insoluble emulsion polymer in the form of a latex, said latex being prepared by an emulsion polymerization process comprising the steps of (a) subjecting a polymerization recipe containing an aqueous medium, a catalyst and an incrementally added emulsion polymerizable ethylenically unsaturated monomer to conditions of emulsion polymerization; (b) adding an excess of a nonionic surfactant to the polymerization recipe when from about 15 to about 70 weight percent of the monomer has been polymerized and (c) continuing addition and emulsion polymerization of remaining monomer, said excess of nonionic surfactant being more than that required to completely cover the total surface area of the emulsion polymer particles of the latex.

3,956,164

CHELATING AGENTS

Jerry Lee Walker, and Thomas Edward Cornelius, III, both of Coraopolis, Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Filed Sept. 23, 1974, Ser. No. 508,125

Int. Cl.² C02B 5/06

U.S. Cl. 252—180 **8 Claims**

1. The method of preventing and removing deposits from the metal surfaces of the aqueous circuit of steam generators by adding to the circulating water or to the feedwater an effective amount of a composition consisting essentially of a blend of approximately a 1:1 molar ratio of nitrilotriacetic acid and ethylenediaminetetraacetic acid.

3,956,165

BLEACHING AID

Gerald D. Hansen, Holicong; Elizabeth G. Varney, Levittown, and Philip S. Davis, Furlong, all of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Division of Ser. No. 374,839, June 29, 1973, Pat. No. 3,878,037. This application Dec. 9, 1974, Ser. No. 531,021

Int. Cl.² C11D 3/395; D06L 3/08; D21C 9/14

U.S. Cl. 252—182 **4 Claims**

1. A bleaching aid which comprises on a weight ratio basis from about 1:12 to 12:1 of a water soluble acrylic acid polymer or water soluble salt thereof, said polymer having a molecular weight of from about 500 to 20,000, and a water soluble carboxy methyl cellulose.

3,956,166

ANTISTRUCTURE AGENT

Richard Newton Lewis, Tecumseh, Mich., assignor to SWS Silicones Corporation, Adrian, Mich.

Division of Ser. No. 481,006, June 20, 1974, Pat. No. 3,925,285. This application May 2, 1975, Ser. No. 574,053

Int. Cl.² C09K 3/00; C08L 0/00; C08G 77/04; C07F 7/02

U.S. Cl. 252—182 **8 Claims**

1. An antistructure agent comprising a mixture of hexamethyltrisiloxane-1,5-diol and 1-methoxy-hexamethyltrisiloxane-5-ol, in which the hydroxyl content is between 5 and 11 percent, the methoxy content is between 2 and 4 percent, and the mole ratio of hydroxyl to methoxy is between 2.5 and 7.

3,956,167

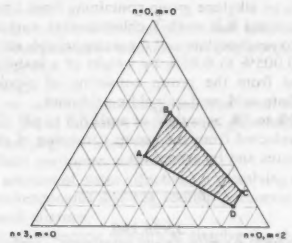
LIQUID CRYSTAL COMPOSITIONS AND DEVICES

Chan Soo Oh, Diamond Bar, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

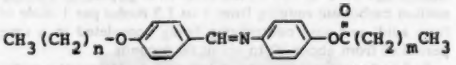
Filed May 17, 1973, Ser. No. 361,333

Int. Cl.² G02F 1/13; C09K 3/34

U.S. Cl. 252—299 **20 Claims**



1. A liquid crystal composition having a nematic range of at least ±50°C of room temperature comprising five compounds wherein three of the compounds are different members of the homologous series having the general formula



wherein n is an integer from 0 to 3 and m is an integer from 0 to 5, each member being present in an amount ranging from 4 to 80 percent by weight based on the total weight of the three members, and the other two compounds are p-methoxybenzylidene-p'-n-butylaniline and p-ethoxybenzylidene-p'-n-butylaniline, each of the two other compounds being present in an amount ranging from 30 to 70 percent by weight based on the total weight of the two compounds, and wherein the total weight of the three members of the homologous series represents from 40 to 70 percent of the total weight of the composition and the total weight of two other compounds represents from 30 to 60 percent of the total weight of the composition.

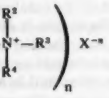
3,956,168

LIQUID CRYSTAL COMPOSITIONS

Yoshi Arai, Oyama; Shoichi Kinoshita, Omiya; Kazuo Kimura, Tokyo; Tomio Wada, Nara; Hisashi Yamamoto, and Fumiaki Funada, both of Tenri, all of Japan, assignors to Dainippon Ink and Chemicals, Incorporated, Tokyo; Dainippon Ink Institute of Chemical Research, Saitama and Sharp Corporation, Osaka, all of, Japan, a part interest to each

Filed Sept. 4, 1973, Ser. No. 394,074
Claims priority, application Japan, Sept. 5, 1972, 47-88393
Int. Cl.² G02F 1/16
U.S. Cl. 252—299 15 Claims

1. A liquid crystal composition comprising a nematic liquid crystal and a quaternary ammonium compound selected from the group consisting of quaternary ammonium salts of mono and dicarboxylic acids represented by the formula



wherein X is a monofunctional carboxylate anion when n is 1 and a difunctional carboxylate anion when n is 2, wherein n is 1 or 2, and carbon atoms and quaternary ammonium hydroxides of the formula

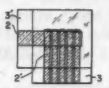
wherein R^1, R^2, R^3 and R^4 are each a hydrocarbon group of 1–20 carbon atoms.

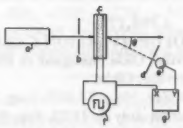
3,956,169

NEMATIC LIQUID CRYSTAL COMPOSITION

Fumio Nakano; Kazuhisa Toriyama; Noboru Nagata, and Mikio Sato, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 21, 1974, Ser. No. 444,532
Claims priority, application Japan, Feb. 23, 1973, 48-21222
Int. Cl.² C09K 3/34; G02F 1/13, 1/16
U.S. Cl. 252—299 18 Claims





1. A dynamic scattertype nematic liquid crystal composition, which comprises a predominant amount of a nematic liquid crystal selected from the group consisting of an N_a-type nematic liquid crystal having a Schiff base type structure within the molecule and an N_a-type liquid crystal having an azoxy structure within the molecule, 0.1 to 1% by weight of a cholesteric compound of optical rotary power, and 0.01 to 5% by weight of a halide of an organic quaternary nitrogen compound having a molecular weight of 110 to 2,100, based on the weight of the nematic liquid crystal.

3,956,170

COUPLED ION EYE-SAFE LASER MATERIAL

Marvin J. Weber, Wayland, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 285,959, Sept. 5, 1972, abandoned, which is a division of Ser. No. 116,987, Feb. 19, 1971, Pat. No. 3,715,683. This application July 1, 1974, Ser. No. 484,907
Int. Cl.² C09K 1/46
U.S. Cl. 252—301.4 R 1 Claim

1. A solid solution single crystal coupled ion laser material comprising $Y_{1-x}Ce_x^{+3}Al_{1-y}V_y^{+3}O_3$ in which x is in the range of from greater than zero to one and y is in the range of from greater than 0 to 0.01 wherein Ce^{+3} and V^{+3} are in an amount sufficient to effect lasing as coupled ions capable of producing coherent radiation at a wavelength between approximately 1.30 microns and 1.55 microns by stimulated emission from an energy state of said V^{+3} having a population inversion of electrons produced therein to an energy state of said Ce^{+3} having substantial depopulation of electrons at ambient temperatures.

3,956,171

PROCESS FOR PREPARING STABLE POSITIVELY CHARGED ALUMINA COATED SILICA SOLS AND PRODUCT THEREOF

Earl P. Moore, Jr., Hockessin, and Ginter Vurlicer, Newark, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed July 30, 1973, Ser. No. 383,821
Int. Cl.² B01J 13/00
U.S. Cl. 252—313 S 13 Claims

1. In a process for preparing a positively charged alumina coated silica sol by mixing a neutral or alkaline aquasol of colloidal silica particles with an aqueous solution of basic aluminum salt to form a reaction mixture, the improvement which comprises imparting stability to the resulting sol of positively charged silica particles by introducing into the reaction mixture sufficient carbonate, bicarbonate or phosphate stablizer which is soluble in the reaction mixture to yield from about 0.20 to 0.45 mol of carbonate or from about 0.06 to 0.15 mol of phosphate or from about X% of 0.20 to 0.45 mol of carbonate or 0.06 to 0.15 mol of phosphate plus (100%—X%) of 0.06 to 0.15 mol of phosphate or 0.20 to 0.45 mol of carbonate, respectively per mol of Al_2O_3 in the basic aluminum salt by the addition of a bicarbonate of calcium, magnesium, sodium, potassium, lithium, ammonium or quaternary ammonium; a carbonate, dihydrogen phosphate or monohydrogen phosphate of sodium, potassium, lithium, ammonium or quaternary ammonium; carbon dioxide; phosphoric acid or mixtures thereof.

8. The product of the process of claim 1.

3,956,172

PROCESS FOR HARDENING MICROCAPSULES CONTAINING HYDROPHOBIC OIL DROPLETS

Keiso Saeki, and Hiroharu Matsukawa, both of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minamiashigara, Japan

Filed July 18, 1973, Ser. No. 380,441
Claims priority, application Japan, July 19, 1972, 47-72227; Aug. 7, 1972, 47-78873
Int. Cl.² B01J 13/02
U.S. Cl. 252—316 6 Claims

1. In a process for hardening microcapsules produced by microencapsulating hydrophobic oil droplets using a complex coacervation process with gelatin as one of the hydrophilic colloids wherein the process includes the steps of

1. emulsifying a water-immiscible oil in an aqueous solution of at least one first hydrophilic colloid ionizable in water and admixing an aqueous solution of at least one second hydrophilic colloid having an electric charge opposite to that of said first colloid,

2. causing coacervation of said colloids to occur by adding water thereto or adjusting the pH thereof to form coacervates,
3. cooling said coacervates to cause gelling thereof,
4. adjusting the pH to alkalinity and adding a hardening agent sequentially or simultaneously,
5. increasing the temperature so as to cause hardening, the improvement wherein glyoxal or glutaraldehyde together with formaldehyde is present during step (4), the amounts employed being (a) with glyoxal, as the amount of glyoxal increases the minimum amount of formaldehyde decreases, such that when the amount of glyoxal per 100 parts of gelatin is 0.6 parts the minimum amount of formaldehyde per 100 parts of gelatin is 0.6 parts, the minimum amount of formaldehyde per 100 parts of gelatin being at least 0.05 parts, and (b) with glutaraldehyde, when the amount of glutaraldehyde per 100 parts of gelatin is less than 5 parts the minimum amount of formaldehyde is at least 0.7 parts, and when 5 or more parts of glutaraldehyde are employed the amount of formaldehyde is not less than 0.05 parts, said parts being by weight.

3,956,173

PREPARATION OF GELS BASED ON CARRAGEENAN

Gordon A. Towle, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed July 5, 1974, Ser. No. 486,137
Int. Cl.² B01J *13/00, 13/02*
U.S. Cl. 252—316 **7 Claims**

1. In the method of preparing a gel based on carrageenan where carrageenan is dissolved in water and contacted with potassium ion, the improvement which comprises the carrageenan being the sodium salt of kappa-carrageenan and the potassium ion being incorporated in the form of a water-soluble potassium salt encapsulated in water-soluble hydroxypropyl cellulose.

3,956,174

RUBBER AND POLYMER PRESERVATIVE

Joseph John Palcher, Santa Ana, Calif., assignor to Very Important Products, Inc., Newport Beach, Calif.

Continuation of Ser. No. 251,162, May 8, 1972, abandoned, which is a continuation of Ser. No. 193,984, Oct. 29, 1971, abandoned. This application Jan. 21, 1974, Ser. No. 434,981
Int. Cl.² C08J *7/06;* **C08K** *9/06;* **C08C** *1/06*
U.S. Cl. 252—400 R **5 Claims**

1. A preservative composition consisting essentially of:
an emulsion of at least one water emulsifiable organopolysiloxane fluid having a viscosity in the range of from about 100 to about 10,000 centistokes and, based on the weight of the polysiloxane fluid from about 65% to about 5,000% by weight of water;
and from about 15% to about 65% by weight based on the weight of the polysiloxane fluid of at least one water miscible polyol compound.

3,956,175

METHOD FOR RECOVERING A LIQUID-PHASE OXIDATION CATALYST FOR PREPARATION OF TEREPHTHALIC ACID

Motoo Shigeyasu, Matsuyama; Hatsutaro Yamazaki, Matsue, and Michio Kuki, Matsuyama, all of Japan, assignors to Matsuyama Petrochemicals Inc., Osaka, Japan

Filed Apr. 22, 1974, Ser. No. 463,025
Claims priority, application Japan, Apr. 20, 1973, 48-44841
Int. Cl.² B01J *37/00;* **C07C** *51/42;* **C01G** *45/00, 51/06*
U.S. Cl. 252—412 **21 Claims**

1. A method for recovering a heavy metal oxidation catalyst comprising a metal selected from cobalt and manganese from the residue of the reaction mother liquor containing the heavy metal oxidation catalyst, organic impurities and a small amount of heavy metal impurities, said residue being obtained by removing a solvent selected from a lower aliphatic monocarboxylic acid from the reaction mother liquor remaining after recovering terephthalic acid from the oxidation reaction product obtained in the process for producing terephthalic acid by subjecting an alkylbenzene to a liquid-phase oxidation with oxygen or an oxygen-containing gas in the presence of the heavy metal oxidation catalyst using said solvent, which comprises:
A. stirring an aqueous dispersion of said residue in the presence of a sulfur compound selected from the group consisting of hydrogen sulfide, sodium sulfide, sodium hydrosulfide, potassium hydrosulfide and ammonium hydrosulfide while contacting a gas containing molecular oxygen with said dispersion wherein the amount of the sulfur compound is not more than about 1% by weight calculated as sulfur based on the weight of the heavy metal component of the catalyst and the amount of water in the aqueous dispersion is about 0.5 to 6 times of the weight of the residue, thereby to extract said heavy metal oxidation catalyst into said aqueous phase, and to precipitate organic impurities and heavy metal impurities,
B. subjecting said aqueous dispersion to a solid-liquid separation at a temperature of not more than about 50°C to separate the solid organic impurities and heavy metal impurities and obtain an aqueous solution containing the oxidation catalyst,
C. adding the aqueous solution containing the oxidation catalyst to an alkali metal or ammonium carbonate or an aqueous solution of an alkali metal or ammonium carbonate while maintaining the temperature of the system at about 26°C to 70°C, to form a solution containing a precipitate of a carbonate of the heavy metal catalyst, and
D. subjecting the solution containing the precipitate of the carbonate of the heavy metal catalyst to a solid-liquid separation to recover the heavy metal catalyst as a carbonate precipitate.

13. The method of claim 1, including diluting the precipitate-containing solution obtained in step (C) with water prior to subjecting said solution to said solid-liquid separation.

3,956,176

CATALYST FOR PREPARATION OF TETRAMETHYL LEAD IN REACTION OF METHYL HALIDE AND SODIUM-LEAD ALLOY

Edward G. Newyear, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 22,693, March 25, 1970, Pat. No. 3,642,849. This application Aug. 26, 1971, Ser. No. 175,339
Int. Cl.² B01J *31/02*
U.S. Cl. 252—426 **2 Claims**

1. A catalyst composition consisting essentially of methanol, diglyme and anthracene.

3,956,177

RHODIUM HYDROFORMYLATION CATALYST

Ernest A. Zuech, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 173,689, Aug. 20, 1971, abandoned. This application July 5, 1973, Ser. No. 376,519
Int. Cl.² B01J *31/18, 31/22*
U.S. Cl. 252—428 **32 Claims**

11. An organorhodium composition consisting essentially of the reaction product obtained by contacting, under suitable conditions to form an intimate mixture, (1) an organorhodium halide of the formula $(L)_nRh(X)_m$ wherein X is selected from the group consisting of chlorine, bromine, and iodine; L is an unsaturated hydrocarbon group selected from the group consisting of cyclic dienes and cyclic trienes containing from 6 to 16 carbon atoms, n represents an integer of from 1 to 2, m represents an integer of from 1 to 2, and the sum of n plus m is equal to 2 or 3; (2) a compound selected from the group consisting of hydrazine and a hydride of a metal selected from

the group consisting of Periodic Table Group IA, IIA, and IIIA metals; and (3) a phosphorus containing adjuvant of the formula L'_3P wherein L' is individually selected from the group consisting of aryl and aryloxy radicals having 6 to 12 carbon atoms; alkaryl, aralkyl, alkaryloxy, and aralkoxy radicals having 7 to 12 carbon atoms; and alkyl and alkoxy radicals having 1 to 12 carbon atoms; said composition being suitable for use as a hydroformylation catalyst.

3,956,178
THREE-COMPONENT METATHESIS CATALYSTS

Alberto Greco; Franco Pirinoli, and Gino Dall'Asta, all of Milan, Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Feb. 13, 1974, Ser. No. 442,238
Claims priority, application Italy, Feb. 14, 1973, 20370/73
Int. Cl.² B01J *31/14*
U.S. Cl. 252—429 B **9 Claims**

1. Catalysts for the metathesis of olefins and cycloolefins containing from 2 to 30 carbon atoms and prepared by mixing
   A. a catalyst-forming component which consists of a complex of a tungsten oxyhalide with (b) an organic ligand selected from the group consisting of phthalodinitrile, adiponitrile and ethyl phthalate, the molar ratio of (a) to (b) being from 1:0.5 to 1:10; with
   B. a catalyst-forming component which is an alkyl aluminium halide the molar ratio of (a) in component (A), the component (B), being from 1:1 to 1:5.

3,956,179
PROCESS FOR THE CHEMICAL MODIFICATION OF SURFACES OF INORGANIC SOLIDS

Imrich Sebestian, Dudweiler, and Istvan Halasz, Saarbruecken, both of Germany, assignors to Istvan Helsaz, Saarbruecken, Germany

Filed Mar. 15, 1974, Ser. No. 451,418
Claims priority, application Germany, Mar. 16, 1973, 2313073
Int. Cl.² B01J *31/02, 21/04, 21/06, 21/08*
U.S. Cl. 252—430 **20 Claims**

1. A process for chemically modifying the free OH-containing surface of an inorganic solid body suitable for use as a stationary phase component in catalysis or chromatography, which comprises:
   a. silanizing said free OH groups with an alkylhalosilane of 1–18 carbon atoms to covalently bond the alkyl groups of said alkylhalosilane to the oxygen atoms of said hydroxyl groups by forming —O—Si-alkyl linkages;
   b. halogenating or sulfochlorinating only said bound alkyl groups to form corresponding haloalkyl or sulfochloroalkyl groups; and
   c. replacing halogen atoms of the resultant haloalkyl or sulfochloroalkyl groups by substitution with a functional group selected from the class consisting of $-SO_3H$, $-NH_2$, $-SH$, $-OH$, $-CN$, $-NO_2$, $-NHR_1$, $-NR_2$, $-NR_3^+$, —COOH and cresyl wherein R is lower alkyl to form said chemically modified inorganic solid body.

3,956,180
HYDROCARBON SOLUBLE MOLYBDENUM CATALYSTS

Stanley Bruce Cavitt, Austin, Tex., assignor to Texaco Development Corporation, Austin, Tex.

Filed Dec. 28, 1970, Ser. No. 102,227
Int. Cl.² B01J *31/12*
U.S. Cl. 252—431 R **6 Claims**

1. A process for preparing a hydrocarbon soluble molybdenum catalyst comprising the steps of: heating an ammonium molybdate with a hydroxy compound containing from 3–30 carbon atoms per molecule wherein said hydroxy compound is selected from the group consisting of organic hydrocarbon primary alcohols, and organic hydrocarbon secondary alcohols to a temperature which dissolves the ammonium molybdate, the hydroxy concentration of said hydroxy compound being in excess of the molybdate concentration of said ammonium molybdate; and,
   oxidizing the ammonium molybdate-alcohol product formed, by refluxing said product in a solvent in the presence of molecular oxygen.

3,956,181
OXIDATION CATALYST

Robert K. Grasselli, Chagrin Falls; Arthur F. Miller, and Wilfrid G. Shaw, both of Lyndhurst, all of Ohio, assignors to The Standard Oil Company (Ohio), Cleveland, Ohio

Filed Sept. 4, 1973, Ser. No. 393,732
Int. Cl.² B01J *23/84, 23/86, 23/88*
U.S. Cl. 252—432 **6 Claims**

1. A catalyst composition having the empirical formula

$$A_a D_b Ni_c Co_d Cr_e Bi_f Mo_{12} O_x$$

wherein
   A is an alkali metal, Tl, In, Ag, Cu, rare earth metal or mixture thereof; and
   D is P, As, Sb, Sn, Ge, B, W, Th, V, Ti, Si or mixture thereof;
and wherein
   a and *b* are 0–4;
   c and *d* are 0 to 20 with $c+d$ greater than or equal to 0.1;
   e i 0.1 to about 10;
   f is about 0.01 to 6; and
   x is the number of oxygens required to satisfy the valence requirements of the other elements present.

3,956,182
OXIDATION CATALYST

Kazuo Ishimi, Takasaki, Japan, assignor to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed June 20, 1974, Ser. No. 481,255
Claims priority, application Japan, June 30, 1973, 48-74014; Dec. 14, 1973, 48-138691; Feb. 21, 1974, 49-19933
Int. Cl.² B01J *27/18*
U.S. Cl. 252—435 **3 Claims**

1. An oxidation catalyst having the composition:

$$Mo_aP_bSb_cZn_dX_eO_f(NH_4)_g$$

wherein, X denotes at least one element selected from the group consisting of chromium, tungsten, iron, cobalt, nickel, copper, tin, manganese, vanadium and bismuth, the subscripts *a*, *b*, *c*, *d*, *e*, and *f* respectively denote the numbers of molybdenum, phosphorus, antimony, zinc, X and oxygen atoms, the subscript *g* denotes the number of ammonium groups, with the proviso that the elements are present in a ratio so that when *a* is 12, *b* is 0.8 to 6, *c* is 0.1 to 7, *d* is less than 4 but not 0, *e* is 0 to 6 and *g* is 0 to 3.5 and *f* is 38 to 81.

3,956,183
CATALYSTS FOR PRODUCTION OF CYCLOALKYLAROMATICS

Ernest A. Zuech, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 334,386, Feb. 21, 1973, Pat. No. 3,829,514. This application May 9, 1974, Ser. No. 468,488
Int. Cl.² B01J *27/06, 29/06, 29/12*
U.S. Cl. 252—441 **10 Claims**

1. A process for the preparation of a promoted ruthenium halide-active clay catalyst which comprises the steps of treating a particulate active clay with aqueous HF followed by impregnation with an alcoholic or aqueous solution of a ruthenium halide and a halide of at least one of iron, cobalt, or nickel, and removing the alcohol or water from the impregnated catalyst by heating at a temperature sufficient to volatilize said alcohol or water, and remove same from said catalyst but insufficient to calcine the catalyst composition.

3,956,184
METHOD OF PREPARING SILVER CATALYST FOR SYNTHESIS OF FORMALDEHYDE BY OXIDIZING METHYL ALCOHOL

Anatoly Abramovich Kruglikov, Vyazovskaya ulitsa, 9, kv. 9; Zemfira Ivanovna Yakovenko, ulitsa Lomonosova, 18, kv. 36; Marina Ivanovna Roznina, Gazetnaya ulitsa, 20, kv. 10; Anna Malofeevna Rogacheva, Pervomaiskaya ulitsa, 70a, kv. 32, and German Ivanovich Belousov, Pervomaiskaya ulitsa, 70a, kv. 49, all of Nizhny Tagil Sverdlovskoi oblasti, U.S.S.R.

Filed Apr. 24, 1974, Ser. No. 463,794
Int. Cl.² B01J *23/50*
U.S. Cl. 252—443 **14 Claims**

1. A method of preparing a silver catalyst for the synthesis of formaldehyde which comprises:

a. mixing a solution selected from the group consisting of an aqueous solution and an aqueous-alcohol solution having a volume ratio of water to alcohol of from 10:90 to 90:10 of a silver compound selected from the group consisting of silver nitrate, silver sulphate, silver acetate, silver cyanide and argentous oxide with a complexing agent selected from the group consisting of ammonia, ethylenediamine, triethylenetetramine and triaminotriethylamine, said complexing agent being added to the solution in a quantity sufficient to produce an alkaline pH and for the formation of complex ions of silver having the general formula $[Ag(X)_n]^+$ where X is ammonia, ethylenediamine, triethylenetetramine or triaminotriethylamine and *n* is 1 or 2;

b. impregnating a carrier with the resulting solution from step (a) at a temperature of from 10° to 100°C;

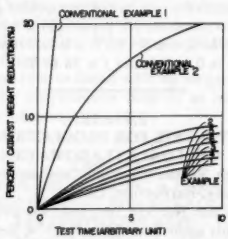
c. treating the impregnated carrier at a temperature of from 10° to 100°C with a reducing agent taken in a quantity sufficient for the complete reduction of metallic silver from said complex ions; and

d. drying the thus-prepared catalyst at a temperature of from 80° to 400°C.

3,956,185
CATALYST FOR EXHAUST GAS PURIFICATION

June Yagi; Harutoki Nakamura, both of Takatsuki, and Yoshiharu Maezawa, Takarazuka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 26, 1973, Ser. No. 427,705
Claims priority, application Japan, Dec. 28, 1972, 48-3378; Dec. 28, 1972, 48-3379; Feb. 5, 1973, 48-14897
Int. Cl.² B01J *29/06*
U.S. Cl. 252—455 R **4 Claims**



1. A catalyst for exhaust gas purification, which comprises glass fibers having a silica content of 96 to 100% by weight, said fibers having been dealkalized by extraction with sulfuric acid and heated at 700° to 1,000°C for 1 to 10 hours; a first silica layer deposited on the surfaces of the glass fibers; a second layer consisting of at least one of the group consisting of alumina, titania, zirconia, magnesia and silica deposited on the surfaces of the first layer; and at least one metal selected from the group consisting of platinum, palladium, rhenium, ruthenium, rhodium, osmium, iridium, nickel, copper, chromium, vanadium, iron, cobalt, manganese, lead, tin, zinc, magnesium, molybenum, silver and their oxides deposited on the surfaces of the second layer as a catalyst component.

3,956,186
ALUMINA COATING FOR SOLID CARRIERS FOR CATALYSTS

Tetsumi Iwase, Okazaki, and Hideki Hara, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Sept. 30, 1974, Ser. No. 510,719
Claims priority, application Japan, Oct. 11, 1973, 48-114218
Int. Cl.² B01J *29/00, 29/06, 23/10*
U.S. Cl. 252—455 R **9 Claims**

1. A method of coating a porous, heat-resistant catalytically inert ceramic carrier for a catalyst which comprises the steps of

coating said carrier with a slurry containing alumina hydrate which has been dried at 250°–350°C for at least 1 hour, colloidal silica, and water,

drying said carrier,

immersing said dried carrier in an aqueous solution of aluminum nitrate containing a nitrate of a metal selected from the group consisting of barium lanthanum and the lanthanides,

removing said carrier from said solution, and drying and firing said carrier.

3,956,187
CATALYST SUPPORT AND METHOD FOR PREPARING THE SAME

Erwin C. Betz, 524 Mill Valley Road, Palatine, Ill. 60067

Filed Jan. 21, 1974, Ser. No. 435,187
Int. Cl.² B01J *29/00, 29/10*
U.S. Cl. 252—457 **33 Claims**

1. A method for preparing a metallic catalyst support having a high surface area from an alloy comprising up to about 5% silicon and a second metal, said second metal being selected from the group consisting of iron, nickel, molybdeum, titanium, vanadium, tungsten, and mixtures thereof, said method comprising: contacting said alloy with an oxidizing acid selected from the group consisting of nitric acid, phosphoric acid, and aqua regia for a time period and at a temperature and acid concentration sufficient to dissolve a portion of said second metal; and subsequently oxidizing said alloy under conditions sufficient to convert silicon at the surface of said alloy to silicon dioxide.

3,956,188
COMPOSITIONS AND METHODS FOR HIGH TEMPERATURE STABLE CATALYSTS

Saul G. Hindin, Mendham, and Joseph C. Dettling, Jackson, both of N.J., assignors to Engelhard Minerals & Chemicals Corporation, Murray Hill, N.J.

Filed Dec. 10, 1973, Ser. No. 423,114
Int. Cl.² B01J *23/16, 23/62, 23/82*
U.S. Cl. 252—465 **20 Claims**

1. A catalyst composition characterized by a surface area of at least 20 m^2/g after calcination for two hours at 1200°C. consisting essentially of (a) a catalytically-active, calcined composite of alumina, a rare earth metal oxide and a metal oxide selected from the group consisting of an oxide of chromium, tungsten, a Group IVB metal, and mixtures thereof, and (b) a catalytically-effective amount of a platinum group metal added thereto after calcination of said composite at a temperature of at least 850°C.

3,956,189

CATALYST FOR TREATING COMBUSTION EXHAUST GAS

Abe Warshaw, Matawan; John S. Negra, South Plainfield, and John F. Tourtellotte, Westfield, all of N.J., assignors to Chemical Construction Corporation, New York, N.Y.

Division of Ser. No. 226,296, Feb. 14, 1972. This application May 18, 1973, Ser. No. 361,778

The portion of the term of this patent subsequent to June 5, 1990, has been disclaimed.

Int. Cl.² B01J *21/04, 23/76*

U.S. Cl. 252—466 J 3 Claims

1. A catalyst composition for the treatment of exhaust gas from an engine to remove noxious components which comprises between about 8% to 20% by weight of copper as equivalent copper oxide, between about 1% to 5% by weight of cobalt as equivalent cobalt oxide, and between about 0.5% to 3% by weight of manganese as equivalent manganese dioxide, said copper, cobalt and manganese being deposited on transitional alumina, said transitional alumina having a surface area in the range of 200 to 400 square meters per gram.

3,956,190

HYDROCARBON CONVERSION CATALYST

John Henry Sinfelt, Berkeley Heights, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Division of Ser. No. 280,253, Aug. 14, 1972, Pat. No. 3,871,996, which is a continuation-in-part of Ser. No. 41,613, May 28, 1970, Pat. No. 3,684,693. This application Dec. 12, 1974, Ser. No. 531,870

Int. Cl.² B01J *21/04, 23/46*

U.S. Cl. 252—466 PT 10 Claims

1. A naphtha reforming catalyst consisting essentially of a refractory support in association with greater than 0.1 wt. % based on total catalyst, of a single catalyst metal selected from the group consisting of iridium, ruthenium and osmium, the surface area of said catalyst metal on said support being at least 150 square meters per gram of catalyst metal as determined by carbon monoxide chemisorption techniques, said catalyst being prepared by a procedure comprising:

a. contacting said support with a solution of a decomposable compound of said catalyst metal,
b. drying said metal-containing support,
c. calcining said metal-containing support at conditions that inhibit the formation of crystalline metal oxides, and
d. reducing said catalyst metal compound to the catalyst metal, said catalyst metal not being present on said support in a crystalline oxide form immediately prior to said reduction.

3,956,191

METHOD FOR MAKING BIMETALLIC CATALYSTS

James A. Cusumano, Rahway, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed May 2, 1974, Ser. No. 466,168

Int. Cl.² B01J *23/66*

U.S. Cl. 252—474 6 Claims

1. A method for making bimetallic catalysts which comprises contacting a catalyst comprising silver metal, said silver metal being in the form of a powder having a surface area from .01 to 100 m^2/g. or present on a refractory metal oxide support, with an aqueous solution comprising a salt of a second metal which is below silver in the electrochemical series whereby a portion of the silver is displaced in the catalyst by said second metal and wherein said second metal is selected from the group consisting of gold, iridium, and platinum.

3,956,192

CATALYST CARRIER

Dieter Nicolai, Meerhole, Germany, assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Oct. 7, 1974, Ser. No. 512,660

Claims priority, application Germany, Oct. 26, 1973, 2353640

Int. Cl.² B01J *35/02*

U.S. Cl. 252—477 R 1 Claim

1. In an all metal catalyst carrier providing uniformly distributed wire throughout the body thereof, the combination comprising a plurality of layers of interlaced, woven, round wire packed one above the other, with each layer of said wire being of an endless, knitted mesh, interwoven loop construction and of a high temperature heat-resistant resistant alloy, a plurality of heat-resistant support screens, said layers being positioned and held between said heat-resistant support screens, and said layers being positioned in an S-arrangement resulting from the laying of a single endless configuration of said wire.

3,956,193

CONDUCTIVITY OF SILICON NITRIDE

John William Henney, Abingdon, and James William Samuel Jones, Blewbury, both of England, assignors to United Kingdom Atomic Energy Authority, United Kingdom

Continuation of Ser. No. 312,310, Dec. 5, 1972, abandoned. This application June 12, 1975, Ser. No. 586,260

Claims priority, application United Kingdom, Dec. 16, 1971, 58381/71

Int. Cl.² H01B *1/00;* C01B *33/02*

U.S. Cl. 252—500 5 Claims

1. A method of forming a shaped electrically conducting silicon nitride artefact, wherein the silicon nitride provides the bonding together of the artefact, and the electrical conductivity is provided by an electrically conducting phase of silicon, which method comprises heating a silicon nitride artefact to a temperature high enough to decompose part of the silicon nitride to silicon but not high enough to evaporate the silicon which is formed, the heating taking place in an environment which is inert to silicon thereby to form an electrically conducting phase of silicon dispersed in a matrix of the silicon nitride, said method further comprising nitriding any silicon formed on the surface of the artefact so as to convert such silicon to silicon nitride.

3,956,194

MIXED CONDUCTORS OF GRAPHITE, PROCESSES FOR THEIR PREPARATION AND THEIR USE

Michel B. Armand, 12 rue Conde, 38100 Grenoble, France

Filed Aug. 17, 1973, Ser. No. 389,617

Claims priority, application France, Aug. 18, 1972, 72.29734

Int. Cl.² H01B *1/06*

U.S. Cl. 252—507 19 Claims

1. A monophased graphite material which is electronically and ionically conductive which graphite material has the formula

$$M_nC_n(M'_yX_z)$$

wherein:

M is Li, Na, K, Rb, Cs or NH_4;
M' is a transition metal;
X is a non-metallic electronegative atom;
x is a whole number greater than 0;
n is the number of C atoms which is combined with the moiety M'_yX_z in a monophase;
y and z are integers representing the relative number of M' and X atoms respectively of the moiety M'_yX_z when it is in an oxidated valence state, said M being bonded to the lattice of an intercalation compound whose formula is $C_n(M'_yX_z)$ wherein M', X, n, y and z have the previously

assigned significance, said M being present in an amount compatible with preservation of an oxidated valence state of the transition metal in the moiety M'_yX_z and the monophased character of the material.

3,956,195

FOAMED POLYMER SEMICONDUCTOR COMPOSITION AND A METHOD OF PRODUCING THEREOF

Mikhail Izmailovich Topchiashvili, ulitsa Tashkentskaya, 27/12, pod'ezd, 3; Taisia Fedorovna Datsko, pereulok Dekabristov, 1; Givi Mikhailovich Kikvilashvili, ulitsa Griboedova, 30, and Ledi Alexeevna Maisuradze, ulitsa Tashkentskaya, 27/12, pod'ezd 1, kv. 3, all of Tbilisi, U.S.S.R.

Filed Feb. 21, 1974, Ser. No. 444,665

Int. Cl.² H01B *1/04*

U.S. Cl. 252—511 **2 Claims**

1. A foamed polymer semiconductor composition having a formulation, in weight parts:

epoxy resin	100
electrically conductive black or graphite	10–60
polyethylhydridesiloxane	0.1–50
polyethylenepolyamine	10–25
organic solvent for epoxy resins	0–50

3,956,196

NOVEL ODORIFEROUS COMPOSITIONS CONTAINING HETEROCYCLIC 4,5-DECAMETHYLENE COMPOUNDS

Marcel Plattier, Antibes; Bernard Shimizu, and Paul José Teisseire, both of Grasse, all of France, assignors to Societe Anonyme Roure Bertrand Dupont, Paris, France

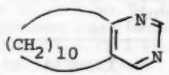
Filed Sept. 16, 1974, Ser. No. 506,213

Claims priority, application Switzerland, Sept. 28, 1973, 13977/73

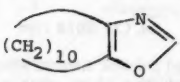
Int. Cl.² A61K *7/46*; C11B *9/00*

U.S. Cl. 252—522 **3 Claims**

1. An odorant composition which contains a carrier and, in addition, as an odorant, a herterocyclic 4,5-decamethylene derivative having the formula I and/or II



I



II

3,956,197

CLEANING COMPOSITION IN DRY POWDER FORM

Daniel Schoenholz, Basking Ridge; Arthur Petersen, Florham Park, both of N.J., and Herbert Terry, Wilton, Conn., assignors to Foster D. Snell, Inc., Florham Park, N.J.

Filed Apr. 15, 1971, Ser. No. 134,462

Int. Cl.² C11D *3/066*

U.S. Cl. 252—526 **17 Claims**

1. A composition in dry powder form at ambient temperature and pressure useful for cleaning when mixed with water comprising:

a. a water-soluble alkaline detergent,

b. a water-immiscible organic liquid absorbed on said water-soluble alkaline detergent in an amount of at least 1% by weight of the total dry solids in said composition, and

c. an emulsifying agent which has an HLB number higher than that required for the water-immiscible organic liquid wherein the cleaning composition, when dispersed in water, forms an unstable emulsion which breaks within 1 hour, releasing droplets of the organic liquid, wherein the quantity of the water-soluble alkaline detergent is sufficient to absorb the organic liquid and form a free-flowing dry powder.

3,956,198

LIQUID LAUNDRY WASHING-AID

Henry Bauer, Miraleste, Calif., assignor to Days-Ease Home Products Corporation, North Hollywood, Calif.

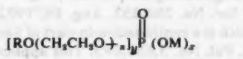
Continuation-in-part of Ser. No. 315,379, Dec. 15, 1972, abandoned, which is a continuation-in-part of Ser. No. 4,090, Jan. 19, 1970, abandoned. This application Aug. 27, 1973, Ser. No. 391,602

Int. Cl.² C11D *1/34, 3/33*

U.S. Cl. 252—542 **18 Claims**

1. A washing-aid composition suitable for removal of stains and soil from delicate fabrics which are deleteriously affected by alkaline pH conditions, said composition consisting essentially of:

a phosphate ester surfactant having the formula



where R is a C_8–C_{20} alkylphenyl group or a C_8–C_{20} alkyl group, n is a number from about 7 to 50, y is a whole number from 1 to 3, x is 0, 1 or 2, M is a hydrogen, sodium or ammonium ion, and the sum of x and y is equal to 3;

an alkali metal salt of an aminopolyacetic acid which is a chelating agent for calcium, magnesium, iron and cobalt in an amount of about 1.5 parts by weight for each part of said surfactant sufficient to essentially neutralize said surfactant to a pH of about 7;

a water miscible organic alcohol solvent in an amount of about 2.0 parts by weight for each part of said surfactant sufficient to solubilize organic borne stains and dirt,

water in an amount sufficient to solubilize said aminopolyacetic acid salt,

said composition having a pH of about 7, and

said composition being substantially free from inorganic phosphate builders.

3,956,199

DISHWASHING COMPOSITIONS

Peter Leonard Dawson, Chester, and Michael Tom Rothwell, Bromborough, both of England, assignors to Lever Brothers Company, New York, N.Y.

Filed Nov. 14, 1973, Ser. No. 415,709

Claims priority, application United Kingdom, Nov. 22, 1972, 54109/72

Int. Cl.² C11D *1/02, 1/66, 3/26*

U.S. Cl. 252—545 **7 Claims**

1. A detergent composition suitable for hand dishwashing having a pH in the range 4–8.5 comprising

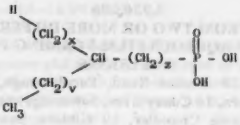
a. 10–50% by weight of an active detergent compound, of which 5–10% is calcium/magnesium sensitive anionic synthetic detergent

b. 1–40% by weight of a solubiliser, of which 0–25% is nonionic solubiliser

c. 0–5% by weight of a pH controller

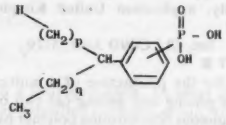
d. an effective amount of an organic phosphonate derived from an acid selected from the group consisting of

(1)



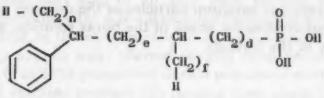
wherein $x + y + z = 8–14$ and the total number of carbon atoms is 10–16

(2)



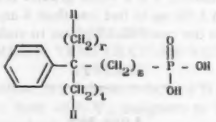
wherein $p + q = 3–7$ and the total number of carbon atoms is 11–15

(3a)



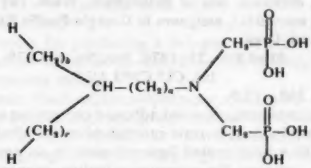
wherein $n + d + e + f = 8–14$ and the total number of carbon atoms is 16-22

(3b)



wherein $r + s + t = 8–14$and the total number of carbon atoms is 15–21

(4)



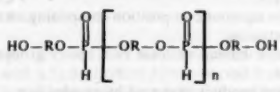
wherein $a + b + c = 11–15$ and the total number of carbon atoms in the alkyl group is 12–16.

3,956,200
FLAME RETARDANT BLENDS FOR FLEXIBLE POLYURETHANE FOAMS

Jerome Biranowski, New York, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Oct. 8, 1970, Ser. No. 79,278
Int. Cl.[2] C08G *18/14, 18/50;* C08K *5/52*
U.S. Cl. 260—2.5 AR **3 Claims**

1. A flame retardant polyurethane foam containing moieties of a blend of (1) a polyglycol hydrogen polyphosphonate having an acid number of less than about 10 mg. of KOH per gram of said polyphosphonate corresponding to the formula:



wherein R is an ether radical of tripropylene glycol and n is an integer having a value of from 1 to 5; and (2) a non-reactive halogen and phosphorus containing reagent selected from the group consisting of tris(dichloropropyl) phosphate and tris(2,3-dibromopropyl) phosphate wherein the ratio of said polyphosphonate to said non-reactive reagent is from 5:1 to 1:1 and wherein the total concentration of said blend in said foam is from about 5 to 25%, by weight.

3,956,201
ARTICLE OF MANUFACTURE HAVING THEREON A STABLE REFLECTIVE COATING CONTAINING FLUORINATED ALIPHATIC RING CHAIN ADDITION POLYMERS

Jerome A. Seiner, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 741,502, July 1, 1968, Pat. No. 3,764,364. This application June 29, 1973, Ser. No. 375,198
Int. Cl.[2] C08J *9/00*
U.S. Cl. 260—2.5 M **5 Claims**

1. A film comprising at least one fluorinated long chain addition polymer comprised of at least one monomer having at least one fluorine atom attached to a carbon chain atom, said film being of sufficient thickness and having sufficient discrete microscopic voids therein to reflect more than 90 percent of incident light having a wavelength of from 2400 to 8000 Angstrom units.

3,956,202
PROCESS FOR PREPARING LOW SMOKE-GENERATING RIGID POLYURETHANE FOAM

Kazuo Iwasaki, Ohta, Japan, assignor to Kohkoku Chemical Industry Co. Ltd., Tokyo, Japan

Filed Apr. 26, 1974, Ser. No. 464,633
Claims priority, application Japan, Nov. 14, 1973, 48-128077; Dec. 22, 1973, 49-2582
Int. Cl.[2] C08G *18/14;* C08K *5/15*
U.S. Cl. 260—2.5 AK **4 Claims**

1. In a low smoke generating rigid polyurethane obtained by heating (A) a polyisocyanate, (B) a polyol having three or more hydroxy groups and a hydroxyl value of 100 and more than 100, and (C) a blowing agent, the improvement which comprises said ingredients (A), (B), and (C) being present in a ratio of chemical equivalents of 1 to 2 parts of ingredient (A) for 1 part of ingredients (B) and (C) combined which react with said ingredient (A), and mixed with at least one member selected from the group consisting of alkyl cellulose, carboxymethyl cellulose, acetyl starch, nitro starch and carboxymethyl starch in the form of powders in an amount exceeding 5% by weight of the composition.

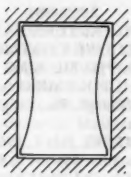
3,956,203
MANUFACTURE OF PARTICULATE EXPANDABLE STYRENE POLYMERS REQUIRING SHOT MINIMUM RESIDENCE TIMES IN THE MOLD

Heinz Bürger, Ludwigshafen; Ludwig Zuern, Bad Duerkheim; Karl Buchholz, Ludwigshafen, and Erhard Stahnecker, Ziegelhausen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Continuation of Ser. No. 383,545, July 30, 1973, abandoned. This application July 28, 1975, Ser. No. 599,526
Claims priority, application Germany, Aug. 3, 1972, 2238128
Int. Cl. C08j *9/24*
U.S. Cl. 260—2.5 B **5 Claims**

1. A process for the manufacture of particulate expandable styrene polymers requiring short minimum mold residence times by polymerizing styrene or mixtures of styrene and other copolymerizable monomers in the presence of low-boiling hydrocarbon expanding agents and from 0.001 to 0.1% by weight, based on the monomers, of a brominated oligomer or polymer of a 1,3-diene having a maximum degree of polymerization of 2000 and containing more than 40% by weight of

bromine at elevated temperatures, wherein the particles forming during polymerization of styrene or said mixtures in the



presence of the bromine compounds are heated, in the course of their manufacture, to temperatures of from 110° to 140°C.

3,956,204

ANTIPUNKING PHENOLIC RESIN BINDER SYSTEMS FOR MINERAL FIBER THERMAL INSULATION

Harold P. Higginbottom, Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Mar. 10, 1975, Ser. No. 556,597

Int. Cl.² C08L *89/00*

U.S. Cl. 260—7 **19 Claims**

1. A single-phase storage-stable aqueous phenolic antipunk resin system which comprises a resole and a condensate of formaldehyde and a nitrogenous compound selected from the group consisting of ammonia, urea, dicyandiamide and melamine; wherein the system has a pH in the range of 6 to 8.5 and contains less than 2 percent of free phenol and less than 2 percent of free formaldehyde based on the weight of the resole, wherein the resole has a number average molecular weight of less than 400, a water tolerance in the range of about 50 to 800 percent and a combined formaldehyde to phenol molar ratio in the range of 2.0:1 to 2.5:1; wherein the condensate has a molar ratio of combined formaldehyde to nitrogenous compound in the range of 0.5:1 to 1.5:1; wherein the molar ratio of combined phenol to nitrogenous compound is in the range of about 0.61:1 to 2:1 producing an antipunk resin system; and wherein the resin system contains sufficient methylolated 2,2'-and 2,4'-dihydroxydiphenylmethanes to inhibit crystallization of the resole.

3,956,205

HIGH EFFICIENCY AQUEOUS RESOLE SOLUTIONS BEING STABLE TO CRYSTALLIZATION AND EMULSIFIABLE WITH METHOD OF MANUFACTURE

Harold P. Higginbottom, Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Mar. 10, 1975, Ser. No. 556,598

Int. Cl.² C08L *89/00*

U.S. Cl. 260—7 **19 Claims**

1. An aqueous solution of an emulsifiable resole wherein the solution has a pH in the range 6 to 8.5 and contains less than 2 percent of free phenol, less than 2 percent of free formaldehyde and between about 1 and about 12 percent of an emulsifier based on the weight of the resole and wherein the resole has a number average molecular weight of less than 300, a water tolerance between about 100 and 800 percent, a combined formaldehyde to phenol molar ratio in the range of 2.0:1 to 2.9:1, and contains sufficient methylolated 2,2'- and 2,4'-dihydroxydiphenylmethanes to inhibit crystallization of the resole solution and wherein the emulsifier is selected to provide a stable emulsion of the resole when water in excess of the water tolerance is added to the solution.

3,956,206

PAINTS FROM TWO OR MORE DIFFERENTLY COLOURED AQUEOUS FILM-FORMING POLYMER EMULSIONS

Keith Sellars, 39 Avenue Road, Farnborough, Hampshire; Peter Laybourn, 14 Coney Gree, Sawbridgeworth, Hertfordshire, and Leslie Chandler, 19 Gilders, Sawbridgeworth, Hertfordshire, all of England

Continuation-in-part of Ser. No. 834,875, June 19, 1969, abandoned. This application July 14, 1971, Ser. No. 162,719

Claims priority, application United Kingdom, June 25, 1968, 30272/68

Int. Cl.² C09D *3/48, 5/29*

U.S. Cl. 260—17 R **13 Claims**

1. A process for the production of a multicoloured paint which comprises mixing and gelling (a) two or more differently coloured aqueous film-forming polymer paint emulsions, each of said emulsions containing polyvinyl alcohol as a protective colloid, with (b) an aqueous solution of borax to form a multicoloured paint dispersion comprising discrete coloured aqueous polymer emulsion particles as the disperse phases in an aqueous continuous phase of the borax solution, and adding a clay of the formula

$$\{Si_n[Mg_{4-x}Li_x] \cdot O_{10} \cdot [(OH)_{4-y}F_y]\}^{x(-)} \frac{x}{n} \cdot M^{n(+)},$$

wherein M is a cation, x is a value greater than zero and less than 6, y is from 1.00 up to but less than 4 and n is an integer from 1 to 3, into the continuous phase to stabilize the dispersion produced.

3,956,207

PHENOLIC ADHESIVES

Kenneth A. E. Blackmore, Bellingham, Wash., and Albert W. Stout, deceased, late of Bellingham, Wash. (by Zelda M. Stout, executrix), assignors to Georgia-Pacific Corporation, Portland, Oreg.

Filed Feb. 25, 1974, Ser. No. 445,275

Int. Cl.² C09J *3/28*

U.S. Cl. 260—17.5 **16 Claims**

1. Thermosetting plywood adhesive comprising a water-soluble phenol-aldehyde resin intermixed under alkaline conditions with a heat-treated lignosulfonate in an amount sufficient to improve the moisture retention properties of the adhesive, said heat-treated lignosulfonate being heated in the dry state at a temperature in the range of 350° to 625°F until from 20% to 50% of the dry heated lignosulfonate is insoluble in an aqueous 0.5 molar sodium carbonate solution.

3,956,208

AQUEOUS EPOXY RESIN COMPOSITION CONTAINING A FATTY ACID POLYAMIDE

Tsuneo Hoki; Kazuo Toyomoto, and Hiroshi Komoto, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 17, 1975, Ser. No. 559,208

Claims priority, application Japan, Mar. 15, 1974, 49-29217

Int. Cl.² C08L *63/02*

U.S. Cl. 260—18 PN **7 Claims**

1. An epoxy resin aqueous composition comprising an aqueous dispersion containing

A. an epoxy resin having at least two epoxy groups per molecule, and

B. a condensation product prepared by condensing

i. a polyamine mixture of 4-aminomethyl-octamethylenediamine and a polyalkylenepolyamine represented by the general formula (III)

$$H_2N-R-NH-(RNH)_n-H \quad (III)$$

wherein R is a straight-chain alkylene group having 2 to 4 carbon atoms and *n* is O or an integer of 1 to 6 in a molar ratio of 4-aminomethyloctamethylene diamine to the polyalkylenepolyamine of about 1:4 to 4:1, with

ii. a reaction product of

a. an α,β-unsaturated carboxylic acid or a C_1–C_4 ester thereof represented by the following general formula (I) or (II)

$$Y-CH=CX-Y \quad (I)$$

$$Y-C\equiv C-Y \quad (II)$$

wherein Y is a hydrogen atom, an alkyl group, a carboxyl group or an esterified carboxyl group with at least one of Y being a carboxyl group or an esterified carboxyl group; and X is a hydrogen atom or a methyl group; and b. a natural or synthetic ethylenically unsaturated monocarboxylic fatty acid or an alkyl ester thereof, the molar proportion of the α,β-unsaturated carboxylic acid or ester thereof to the ethylenically unsaturated monocarboxylic fatty acid or ester thereof ranging from about 1:0.2 to 1:1.0; and the proportion of said polyamine mixture (i) to said reaction product (ii) ranging from about 0.3 to 1.3 mol per equivalent of acid.

3,956,209
TWO-PART ROOM TEMPERATURE VULCANIZABLE SYSTEMS

Stephen B. Hamilton, Jr., Schenectady, and Warren R. Lampe, Ballston Lake, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 387,460, Aug. 9, 1973, Pat. No. 3,839,246. This application July 5, 1974, Ser. No. 486,117

Int. Cl.² C08L *91/00*

U.S. Cl. 260—18 S **5 Claims**

1. A process for producing a two-part room temperature silicone rubber composition with improved hydrolytic resistance comprising mixing,

a. a linear, fluid organopolysiloxane containing terminal silicon-bonded hydroxy groups and having a viscosity of 500 to 10,000,000 centipoise when measured at 25°C, the organic groups of the aforesaid organopolysiloxane representing monovalent hydrocarbon radicals,

b. a filler,

c. from 0.1 – 15% by weight percent of an alkyl silicate selected from the class consisting of (1) a monomeric organosilicate corresponding to the general formula,

$$(R^{40}O)_3Si\text{-}R^{41},$$

where R^{40} is a radical selected from the class consisting of monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals and R^{41} is selected from the class consisting of alkyl, haloalkyl, aryl, haloaryl, alkenyl, cycloalkyl, cyclohexyl, cyanoalkyl, alkoxy and acyloxy radicals, and (2) a liquid partial hydrolysis product of the aforementioned organosilicate monomeric compounds,

d. from 0.1 to 5% by weight of the organopolysiloxane of a catalyst which is the reaction product of an organo tin oxide having the formula,

$$R''R'''SnO$$

where R'' and R''' are monovalent hydrocarbon radicals with a hydrocarbon ester selected from the class consisting of esters of monocarboxylic acids, esters of dicarboxylic acids and esters of inorganic acids containing at least one oxygen atom in the said radical attached to a replaceable hydrogen atom, where there is reacted from 6 to 1 moles of the organo tin oxide per mole of the ester and the reaction is carried out at a temperature in the range of from room temperature to 250°C.

3,956,210
COATING COMPOSITIONS COMPRISING DERIVATIVES OF AUTOXIDIZABLE MALEINIZED FATTY ACIDS

Bruce Leary, Frankston, and Frederick John Lubbock, Beaumaris, both of Australia, assignors to Dulux Australia Ltd., Melbourne, Australia

Filed Nov. 29, 1974, Ser. No. 528,547

Claims priority, application Australia, Dec. 11, 1973, 5952/73

Int. Cl.² C09D *3/52, 3/66*

U.S. Cl. 260—21 **3 Claims**

1. A coating composition which comprises a blend of:

1. the substance obtained by reaction of

a. an autoxidizable maleinized monocarboxylic fatty acid comprising the reaction product of 1 mol of maleic anhydride per mol of monocarboxylic fatty acid with

b. a diol and an alkylene oxide wherein said substance is characterized by two unreacted hydroxyl groups and one unreacted carboxyl group and is further characterized by a mono-ester linkage of a diol and a mono-ester linkage of an alkylene oxide and

2. A cross-linking agent for the said substance in the weight ratio of from 70:30 to 95:5 of (1) to (2).

3,956,211
ALKYD-TYPE RESIN COMPOSITION CONTAINING CHELATE COMPOUND HAVING CATALYTIC ACTIVITY

Shigeaki Muto; Shungi Masuda; Kanemasa Nomaguchi; Hisao Tanaka, and Hiromi Kochi, all of Hitachi, Japan, assignors to Hitachi Chemical Company, Ltd., Japan

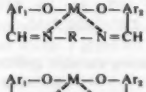
Filed July 20, 1973, Ser. No. 381,004

Claims priority, application Japan, July 24, 1972, 47-73421; Dec. 29, 1972, 48-3049

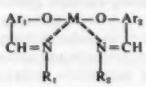
Int. Cl. C08f *21/04;* **C08g** *17/16;* **C09d** *3/68*

U.S. Cl. 260—22 CA **23 Claims**

1. An alkyd resin composition comprising an alkyd resin and a chelate compound having a catalytic activity and represented by the formula



or



wherein M is a metal of the first transition metal group except for nickel, lead, or zirconium; Ar_1 and Ar_2 are independently an aromatic residue, a substituted aromatic residue, or a heterocyclic aromatic residue; R,R_1 and R_2 are independently hydrogen, an alkyl residue, a cycloaliphatic alkyl residue, a substituted aromatic residue, or a jointed residue of these radicals, and the carbon chains of R, R_1 and R_2 may contain hetero atoms selected from the group consisting of O, N and S, said chelate compound being present in said composition in an amount that promotes curability of said alkyd resin.

3,956,212
ETHYLENE RESIN COMPOSITION

Fumio Sakaguchi, Yokohama; Tadao Suzuji, and Isamu Yamazaki, both of Kawasaki, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 21, 1973, Ser. No. 343,334

Claims priority, application Japan, Mar. 23, 1972, 47-28580

Int. Cl.² C08K *3/22, 5/09*

U.S. Cl. 260—23 H **54 Claims**

1. A resin composition comprising 70 to 5 parts by weight of an ethylene polymer containing at least 80 mol percent ethylene and 30 to 95 parts by weight of alumina trihydrate having a gibbsite crystal structure and containing at least 0.20 percent by weight of fixed sodium compounds represented as Na_2O, said alumina trihydrate having a monoclinic crystal system in which the lattice constant is measured as a=8.62 A, b=5.06 A and c=9.70 A, the beta angle is 85°26, and the refractive index is expressed as α=1.568, β=1,568 and γ=1,587.

54. The resin composition according to claim 1, wherein said resin composition contains 0.1 to 5 parts by weight per 100 parts by weight of said resin composition of a metal salt of a higher aliphatic acid selected from the group consisting of barium stearate, calcium stearate, magnesium stearate, aluminum stearate, cadmium stearate, and zinc stearate.

3,956,213
SUSPENSION AGENT FOR SYNTHETIC PLASTICS POWDER

Josef Hefele, Grafelfing, Germany, assignor to Kufner Textilwerke KG., Munich, Germany

Filed May 9, 1973, Ser. No. 358,777

Claims priority, application Germany, June 15, 1972, 2229308

Int. Cl.² C08L *91/00*

U.S. Cl. 260—23 R **10 Claims**

1. Suspension agent for synthetic plastics powders for spotwise coating of interlings for articles of clothing, comprising an aqueous solution of the salt of a polymeric organic acid in a concentration of 0.05 to 3% by weight, and additionally containing in extremely fine dispersion of a member selected from the group of 4 to 15% by weight of an unsubstituted fatty acid and 0.05 to 15% by weight of a hydroxy substituted fatty acid.

3,956,214
METHOD OF PREPARING CURABLE PELLETS OF POLYETHYLENE WITH A MOTIONLESS MIXER

Stanley L. Tate; Bobby A. Rowland, both of Carroll County, Ga., and Michael M. Blackstone, Duval County, Fla., assignors to Southwire Company, Carrollton, Ga.

Filed Nov. 5, 1974, Ser. No. 521,113

Int. Cl.² C08J *3/20*

U.S. Cl. 260—23 H **8 Claims**

1. A method of preparing curable pellets of polyethylene and copolymers of polyethylene comprising the steps of:

a. fusing polymers such as polyethylene and copolymers thereof with fillers, lubricants and antioxidants in a plasticating means until said fillers, lubricants and antioxidants are evenly dispersed throughout the polymers;

b. processing the final polymer, filler, lubricant, antioxidant mixture into the pellets;

c. contacting and mixing said pellets with a stoichiometric amount of a curing agent in a heated motionless mixer at a temperature below the softening point of the polymers and at a temperature below the decomposition temperature of said curing agent whereby said curing agent is absorbed into said pellets; and

d. cooling said polymer curing agent mixture to ambient temperature before storage.

3,956,215
WATER-SOLUBLE ACIDIC POLYESTERS AND THERMOSETTING WATER-BASED COATINGS CONTAINING THEM

Richard A. Lamanna, Jefferson Borough, and Dwight L. Stephens, Ross Township, both of Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 442,945, Feb. 15, 1974, Pat. No. 3,903,051. This application Feb. 18, 1975, Ser. No. 550,392

Int. Cl.² C08L *61/28*

U.S. Cl. 260—29.4 R **5 Claims**

1. A thermosetting coating composition comprising a water-soluble, up to 80 per cent solids, acidic polyester produced by polyesterifying an aliphatic hydroxy polycarboxylic acid selected from the group consisting of citric acid, tartaric acid, malic acid, and α, β-dihydroxytricarballylic acid with a compound selected from the group consisting of alkylene oxides having from 2 to 4 carbon atoms, alkylene glycols having from 2 to 6 carbon atoms, and styrene oxide, using a ratio of hydroxyl equivalents to carboxyl equivalents of 5:3 to 2:3, until the acid number is 120 – 250, depending on the reactant combination, and an aminoplast in an aqueous vehicle.

3,956,216
LATEX COMPOSITIONS CONTAINING POLYMERS HAVING REACTIVE AZOLIDE CURE SITES

Harold A. Tucker, Shaker Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

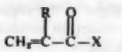
Division of Ser. No. 460,825, April 15, 1974, Pat. No. 3,912,682. This application July 23, 1975, Ser. No. 598,357

Int. Cl.² C08L *39/04, 33/08, 33/14, 33/22*

U.S. Cl. 260—29.7 H **6 Claims**

1. A latex composition comprising (A) 100 parts by weight of a latex containing a polymer consisting essentially of interpolymerized units of (1) from about 50 percent to about 99.5 percent by weight of an acrylic ester monomer of the formula

wherein R is hydrogen, or a methyl or ethyl radical and R_a is selected from the group consisting of alkyl radicals containing 1 to about 24 carbon atoms and alkoxyalkyl radicals, containing 2 to about 12 carbon atoms total in the radical, (2) from about 0.5 percent to about 50 percent by weight of an ethylenically unsaturated azolide of the formula



wherein R is defined as above and X is an azole radical comprised of a 5-membered unsaturated heterocyclic ring having at least two nitrogen atoms and two conjugated double bonds contained therein, where the carbonyl structure is directly attached to a nitrogen atom of the azole, and (3) up to 20 percent by weight of a copolymerizable vinylidene monomer, and (B) from about 0.5 part to about 10 parts by weight based upon 100 parts by weight of polymer in the latex of a di- or polyfunctional alcohol.

3,956,217

LATEX SETTING MATERIALS

Keith Frederick Gazeley, Welwyn Garden City, England, assignor to The Malaysian Rubber Producers Research Association, England

Filed May 29, 1974, Ser. No. 474,443
Claims priority, application United Kingdom, June 1, 1973, 26377/73
Int. Cl.² C08L 9/08, 13/02
U.S. Cl. 260—29.7 NR 8 Claims

1. A method of making a set product, which method comprises:

a. providing a fluid composition comprising:

a latex of natural or synthetic rubber,

from 1.5 to 15 pphr by weight of a stabilizer for the latex,

from 20 to 200 pphr by weight of a polymerizable ethylenically unsaturated organic material comprising at least one monomer which will polymerize in the presence of the latex, selected from styrene and acrylic and methacrylic monomers,

from 2 to 20 pphr by weight of a heat sensitizer for the latex selected from the group consisting of polyoxyalkylene diols and polyvinyl methyl ethers,

the composition containing not more than 50% by weight of water, and

b. initiating polymerization of the polymerizable unsaturated organic material at ambient temperature so as to cause the composition to form a set product.

3,956,218

AGGLOMERATING AQUEOUS DISPERSIONS OF SYNTHETIC RUBBER

Hans Georg Keppler, Weinheim, and Hermann Wesslau, Bad Durkheim, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Continuation of Ser. No. 725,915, May 1, 1968, abandoned. This application Oct. 26, 1971, Ser. No. 192,566
Claims priority, application Germany, May 5, 1967, 1720058
Int. Cl.² C08L 9/08, 9/10
U.S. Cl. 260—29.7 D 2 Claims

1. An aqueous synthetic rubber dispersion comprising an aqueous dispersion of particles of polybutadiene or a synthetic rubber copolymer in which the monomer units consist of at least 20% by weight of butadiene, said copolymer having a glass temperature below 20°C, and said particles being agglomerated by dispersion in said synthetic rubber dispersion of an alkali insoluble copolymer, said synthetic rubber copolymer being a copolymer of at least 20% by weight of butadiene copolymerized with, as the remainder of said copolymer, at least one of styrene, acrylonitrile, n-butylacrylate, vinylmethylether, methacrylamide and acrylic acid, and said alkali insoluble copolymer is a copolymer of 75–99.9% by weight of ethyl acrylate and 0.5–25% by weight of acrylamide, the percentage totalling 100%, 0.1 to 30 parts by weight of the copolymer being used per 100 parts by weight of the dispersed synthetic rubber, and the particles of said alkali insoluble copolymer being more hydrophilic than the dispersed particles of said synthetic rubber.

3,956,219

CROSSLINKED POLYSTYRENE AND SUBSTITUTED POLYSTYRENE COMPOSITIONS

Edward L. Smithwick, Jr., Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 328,551, Feb. 1, 1973, Pat. No. 3,857,829. This application Oct. 11, 1974, Ser. No. 514,165
Int. Cl.² C08K 5/01, 5/02, 5/14, 5/34
U.S. Cl. 260—30.2 7 Claims

1. A composition which comprises a resin crosslinked with from about 0.5 to about 3 percent by weight divinylbenzene and swollen to an equilibrium state by a solvent which is essentially N-methyl-2-pyrrolidone, which resin is polystyrene or a polystyrene substituted with an anchoring group capable of reacting with the amino or carboxy terminus of an amino acid or peptide to give a covalent bond.

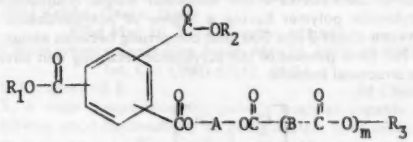
3,956,220

VINYL RESINS PLASTICIZED WITH MIXED MELLITATE COMPOUNDS

Roland Hendrick Riem, Oakville, and Alfred Johannes Dieterman, Mississauga, both of Canada, assignors to Emery Industries, Inc., Cincinnati, Ohio

Division of Ser. No. 417,585, Nov. 20, 1973, Pat. No. 3,888,909. This application Feb. 3, 1975, Ser. No. 546,538
Claims priority, application Canada, Nov. 23, 1972, 157257
Int. Cl.² C08K 5/12; C08L 27/06
U.S. Cl. 260—31.6 3 Claims

1. A plasticized vinyl resin composition having improved resistance to hydrocarbons comprising 100 parts by weight of a vinyl halide resin selected from the group consisting of polyvinyl chloride homopolymer and polyvinyl chloride copolymer and 5 to 100 parts of a mixed mellitate composition of the formula



wherein R_1, R_2 and R_3 are saturated hydrocarbon radicals containing from 1 to 22 carbon atoms, A is a saturated bivalent hydrocarbon radical containing from 2 to 8 carbon atoms, B is a saturated bivalent hydrocarbon radical containing 2 to 20 carbon atoms and m is an integer of 1 or 0.

3,956,221

RAPID SETTING NON-ELASTOMERIC POLYURETHANE COMPOSITIONS CONTAINING A NON-HYDROXYL CONTAINING ESTER-MODIFIED POLYOXYLKYLENE COMPOUND

Franciszek Olstowski, Freeport, and Donald B. Parrish, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 425,467, Dec. 17, 1973, which is a continuation-in-part of Ser. No. 366,835, June 4, 1973, Pat. No. 3,878,157, which is a continuation-in-part of Ser. No. 179,149, Sept. 9, 1971, abandoned. This application May 1, 1975, Ser. No. 573,638
Int. Cl.² C08K 5/10
U.S. Cl. 260—31.6 17 Claims

1. A non-elastomeric, non-cellular solid polymer having a density of at least about 1 gram/cc, a percent elongation of less than 80, resulting from admixture of the components of a composition comprising:

A. a polyether polyol having from 3 to about 8 hydroxyl groups and a hydroxyl equivalent weight between about 75 and about 230;

B. an organic polyisocyanate;

C. a liquid modifier compound having a boiling point above about 150°C selected from the group consisting of non-hydroxyl-containing ester-modified polyoxyalkylene compounds having an average molecular weight above about 700 mixtures thereof, and

D. an non-amine-containing catalyst for urethane formation, which is an organometal compound;

wherein components (A) and (B) are present in amounts so as to provide an NCO:OH ratio of from about 0.8:1 to about 2:1, component (C) is present in quantities of from about 20

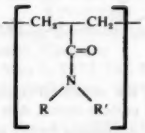
to about 50 percent with the proviso that when component (B) is a prepolymer containing less than about 40% NCO groups by weight, then component (C) is present in quantities of from about 10% to about 50% by weight of the sum of components (A), (B) and (C); and component (D) is present in quantities of from about 0.2 to about 10 percent by weight of the sum of the weights of components (A), (B) and (C); and wherein said polymer can be demolded within less than about 5 minutes without the application of an external source of heat, after admixture of said composition.

3,956,222
POLYVINYL CHLORIDE PASTE COMPOSITIONS

Hiroshi Abe, Okayama; Koichi Kazitani; Koichi Saito, both of Kurashiki, and Hisashi Nakamoto, Hayashima, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Mar. 22, 1974, Ser. No. 453,821
Claims priority, application Japan, Mar. 22, 1973, 48-33306
Int. Cl.² C08J *3/08*; C08K *5/02*, *5/20*; C08L *27/06*
U.S. Cl. 260—32.6 R **10 Claims**

1. In a paste composition comprising particles of a polyvinyl chloride resin dispersed in an organic vehicle, the improvement which comprises, as a component thereof, from about 0.05 to 10 PHR of a low molecular weight N-substituted acrylamide polymer having a degree of polymerization of between about 2 and 500, and comprising between about 30 to 100 mole percent of the acrylamide recurring unit having the structural formula:



wherein R and R′ are either hydrogen or lower alkyl having from 1 to 4 carbon atoms, and wherein R and R′ together cannot both be hydrogen.

3,956,223
HOT-MELT PRESSURE-SENSITIVE ADHESIVE

Joseph Shing Chiang, Skokie, and Charles Bartell, Highland Park, both of Ill., assignors to Borden, Inc., Columbus, Ohio

Filed July 1, 1974, Ser. No. 484,827
Int. Cl.² C08K *5/01*; C09J *7/04*
U.S. Cl. 260—33.6 AQ **10 Claims**

1. A solvent-free hot-melt pressure-sensitive adhesive comprising:

A. 100 parts by weight of a block copolymer having the general configuration

A—B—A

wherein,

1. each A is an independently selected polymer block of a vinyl arene, the average molecular weight of the block being between about 5,000 and about 125,000;
2. B is a polymer block of a conjugated diene, the average molecular weight of the block being between about 15,000 and about 250,000;
3. the total blocks A being 10 to 35% by weight of the copolymer;

B. 50 to 200 parts by weight of tackifying resin;

C. 10 to 45 parts by weight of naphthenic plasticizer oil wherein the naphthenic content of the plasticizer oil based upon carbon content lies between 52% and 75% of the total aromatic, paraffinic and naphthenic content of the oil;

D. 0.1 to 1.75 parts by weight of a heat-activated curing agent; and

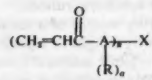
E. 0.1 to 10 parts by weight of an antioxidant.

3,956,224
PREPARATION OF POWDERED CROSSLINKED POLYALKYLENE OXIDES

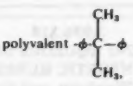
Nan S. Chu, Hartsdale, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 160,133, July 7, 1971, abandoned. This application June 29, 1973, Ser. No. 375,147
Int. Cl.² C08K *5/01*
U.S. Cl. 260—33.6 R **14 Claims**

1. A process for producing powdered crosslinked poly (ethylene oxide) with a crosslinking agent represented by the formula



wherein A is nitrogen or oxygen; *n* has a value of 2 or more, R is hydrogen, an alkyl of 1–6 carbon atoms or aryl of 6 to 14 carbon atoms; X can be a (substituted or unsubstituted polyvalent) residue of an organic compound selected from the group consisting of — CyH_{2y} — wherein Y is an integer of 1 to 50, — C_xH_{2x} $(OC_xH_{2x})m$ — wherein *x* is an integer of 2 to 4 and *m* is an integer of 1 to 1,000 or more, a polyvalent cycloalkyl of 5 to 7 ring carbon atoms, a polyvalent arylene of 6 to 14 ring carbon atoms,



di or trivalent glyceryl, trimethylol propane, the divalent, trivalent and tetravalent residues of pentaerythritol, the polyvalent residues of the epoxidized fatty acid glycerides, and the divalent, trivalent or higher polyvalent residues of carbohydrates; with the proviso that when A is oxygen, *a* is 0 and when A is nitrogen, *a* is 1; in the presence of a free radical catalyst and a liquid medium containing a solvent-nonsolvent mixture for the poly(ethylene oxide) wherein the nonsolvent portion constitutes at least about 35% and up to 100% by weight of the liquid medium, at a temperature sufficiently elevated to effect cross-linking.

3,956,225
STABLE DISPERSION OF VINYL POLYMER

Koichiro Murato; Minoru Shibata, and Tadashi Watanabe, all of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Japan

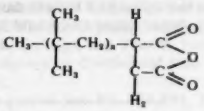
Filed July 13, 1973, Ser. No. 379,053
Claims priority, application Japan, July 20, 1972, 47-72002
Int. Cl.² C08J *3/08*; C08K *5/01*; C08L *23/00*
U.S. Cl. 260—33.6 UA **10 Claims**

1. Method for producing a stable dispersion of vinyl polymer which is characterized by the steps of:

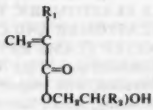
A. preparing aliphatic chain monomer through half-esterification between alkyl succinic anhydride and hydroxyalkyl ester of acrylic acid or methacrylic acid at a temperature of 60° to 150° C. for 30 minutes to 5 hours, and then preparing a copolymer having a comb structure through copolymerization in the presence of a polymerization initiator of 100 parts by weight of said aliphatic chain monomer and 50–200 parts by weight of vinyl monomer in a solvent, the amount of monomers in the solvent being 20–30% by weight, at a temperature of 60° to 150° C., whereby a dispersion stabilizer is obtained; and

B. preparing said dispersion of vinyl polymer by polymerization of vinyl monomer in the presence of 5–30% by weight of the total resin content of said dispersion of the thus obtained solution of copolymer having comb structure in hydrocarbon solvent,

wherein said alkyl succinic anhydride is of the formula



in which *n* is an integer from 7 to 70 and said hydroxyalkyl ester is of the formula



in which R_1 is hydrogen or methyl and R_2 is hydrogen or alkyl of 1 to 3 carbon atoms.

3,956,226

PIGMENTED COMPOSITION

Warren B. Blumenthal, North Tonawanda, N.Y., assignor to N L Industries, Inc., New York, N.Y.

Division of Ser. No. 413,178, Nov. 5, 1973, Pat. No. 3,870,787. This application Dec. 2, 1974, Ser. No. 528,622

Int. Cl.² C01G *23/00, 25/00;* **C08K** *3/24*

U.S. Cl. 260—37 EP **4 Claims**

1. A pigmented composition containing as a pigment a crystalline compound having a composition which can be represented by the formula $CaTiZr_2O_6$ and characterized by an x-ray diffraction spectrogram, the most prominent *d* spacings of which are as follows:

d	R.I.
7.56	7
3.48	11
2.93	100
2.53	21
2.17	6
1.79	51
1.65	6–7
1.59	5
1.53	30
1.46	5–6

the relative intensities of the several listed diffracted reflections with respect to the intensity of the strongest reflection in the x-ray diffraction spectrogram of a typical product being as set forth in the column headed R.I., and a liquid vehicle.

3,956,227

MOULDING COMPOUNDS

Kevin M. Foley, Hebron; Robert L. Muto, Newark, and Anil K. Rastogi, Granville, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jan. 2, 1975, Ser. No. 537,870

Int. Cl.² C08K *61/06*

U.S. Cl. 260—38 **14 Claims**

1. A molding compound consisting essentially of a mixture of

1. a thermosetting resin of at least one of phenol-formaldehyde condensates, phenol-aminoplast-formaldehyde condensates, aminoplast-formaldehyde condensates, resorcinol-formaldehyde condensates, or resorcinol-formaldehyde-urea condensates;
2. at least one inorganic cement, wherein said cement is present in an amount within the range of from about 1 to about 9 parts by weight of cement per part by weight of the water content of the thermosetting resin; and
3. 0.01 to 10.0 weight percent of a coupling agent based on the total weight of the coupling agent wherein the coupling agent is at least one organo silane containing at least two hydrolyzable silane groups wherein the distance between any two hydrolysis cites of a glass fiber is greater than the distance between any two hydrolyzable silane groups in the organo silane and wherein the coupling agent has the general formula

$$(RO)_3SiR'Si(OR)_3$$

wherein each R is an alkyl or aryl group containing from 1 to 10 carbons and R′ is an alkylene or phenylene group containing from 1 to 15 carbons.

3,956,228

POLYESTER RESIN COMPOSITION FOR POWDER COATINGS PREPARED FROM ENDOMETHYLENETETRAHYDROPHTHALIC ACID

Sumitaka Nogami, Nobeoka; Kazuo Toyomoto, Fuji; Katsuyuki Nakamura, Nobeoka; Keiichi Waki, Nobeoka; Tooru Okada, Nobeoka; Izumi Fujita, Nobeoka; Masayuki Nanpo, Nobeoka; Shougi Misawa, Nobeoka, and Chikako Nagano, Tokyo, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 20, 1974, Ser. No. 471,656

Claims priority, application Japan, May 21, 1973, 48-55533

Int. Cl.² C08G *63/52, 63/54*

U.S. Cl. 260—40 R **24 Claims**

1. A resin composition for powder coatings capable of exhibiting good hardenability on being heated, after application, in the air at 150°C to 220°C for 10 to 40 minutes, which composition consits essentially of a polyester component having a softening point of 40° to 180°C and a number-average molecular weight of 500 to 8,000, said polyester component being obtained from a dibasic acid mixture containing (1) 10 to 50 mole % of endomethylenetetrahydrophthalic acid and the remaining portion of the mixture being a dibasic acid selected from the group consisting of aromatic dibasic acids, unsaturated dibasic acids and aliphatic dibasic acids and (2) a glycol.

20. A resin composition for powder coatings capable of exhibiting good hardenability on being heated, after application, in the air at 150°C to 220°C for 10 to 40 minutes, which composition consists essentially of from 0.1 to 50% by weight of a pigment, from 0.01 to 5% by weight of an additive selected from the group consisting of flow agents, color stabilizers and fluorescent whitening agents and a polyester component having a softening point of 40° to 180°C and a number-average molecular weight of 500 to 8,000, said polyester component being obtained from a dibasic acid mixture containing (1) 10 to 50 mole % of endomethylenetetrahydrophthalic acid and the remaining portion of the mixture being a dibasic acid selected from the group consisting of aromatic dibasic acids, unsaturated dibasic acids and aliphatic dibasic acids and (2) a glycol.

3,956,229

FILMS AND SHEETS OF POLYESTER-POLYCARBONATE BLENDS

Phillip Stuart Bollen, Auburn; Surendra A. Amin, Pottsville, both of Pa., and William Sacks, Gillette, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed July 16, 1974, Ser. No. 489,017

Int. Cl.² C08G *39/10*

U.S. Cl. 260—40 R **11 Claims**

1. An essentially non-oriented film or sheet capable of being thermoformed into a shaped article and being formed from a blend of about 60 to 85 parts by weight of a polyethylene terphthalate having an intrinsic viscosity of at least about 0.90 and correspondngly about 40 to 15 parts by weight of a polycarbonate, the polethylene terephthalate fraction of said film

or sheet having a degree of crystallinity in the range of about 20 to 40%.

3,956,230

COMPATIBILIZATION OF HYDROXYL-CONTAINING FILLERS AND THERMOPLASTIC POLYMERS

Norman G. Gaylord, New Providence, N.J., assignor to Champion International Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 702,204, Feb. 1, 1968, Pat. No. 3,645,939. This application Aug. 21, 1970, Ser. No. 66,107

Int. Cl.² C08K *9/04, 9/10*

U.S. Cl. 260—42.14 **22 Claims**

1. A process for preparing a compatibilized, filled polyolefin composition comprising encapsulating hydroxyl group containing filler particles with a coating of a polyolefin by mixing said filler particles and said polyolefin and thereafter mixing with maleic anhydride or poly(maleic anhydride) and a free radical catalyst under conditions which will generate free radicals on the polyolefin, whereby said polyolefin coating is coupled to said filler, and said polyolefin coated filler particles are thereafter dispersed in a polyolefin matrix, said composition being thermoplastic.

3,956,231

FLAME AND SMOKE RETARDANT STYRENE POLYMER COMPOSITION

Fred W. Moore, Plymouth; Calvin J. Hallada, and Henry F. Barry, both of Ann Arbor, all of Mich., assignors to Amax Inc., New York, N.Y.

Filed Sept. 3, 1974, Ser. No. 502,719

Int. Cl.² C08J *3/20*

U.S. Cl. 260—42.14 **13 Claims**

1. A flame retardant synthetic resin composition comprising a body composed of a styrenic resin having dispersed therethrough a flame retardant agent comprising a molybdenum compound selected from the group consisting of molybdenum trioxide, ammonium dimolybdate, ammonium heptamolybdate and mixtures thereof and a halogenated hydrocrabon compound apart from said styrenic resin selected from the group consisting of halogenated aromatic compounds, halogenated cyclic aliphatic compounds and mixtures therof, said molybdenum compound present in an amount sufficient in combination with said halogenated compound to impart flame retardant and smoke suppressant characteristics to said composition, said halogenated compound present in an amount to provide sufficient halogen atoms for reaction with the molybdenum constituent to form volatile molybdenum oxohalide compounds.

10. The flame retardant synthetic resin composition as defined in claim 1, wherein at least a portion of said molybdenum compound is present in the form of a coating on the surfaces of an extender filler.

3,956,232

PREPARATION OF ORGANOMETAL TERMINATED POLYMERS

Carl A. Uraneck, and Richard L. Smith, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 307,773, Nov. 20, 1972, which is a continuation of Ser. No. 92,214, Nov. 23, 1970, abandoned. This application July 1, 1974, Ser. No. 484,692

Int. Cl.² C08C *19/26;* C08F *8/42*

U.S. Cl. 260—42.32 **14 Claims**

1. A process for improving the physical properties of polymer containing terminal reactive alkali metal or alkaline earth metal groups the improvement which comprises reacting said polymer containing terminal reactive alkali metal or alkaline earth metal groups with a reagent consisting essentially of an organometal compound represented by the formula $R_{(z-1)}MX$ wherein R is a hydrocarbon radical, M is a metal selected from Groups 2b, 4a, or 5a, X is a radical selected from the group consisting of halogen, —OR, —SR, and $—N(R)_2$, and z is an integer equal to the valence of M, and thereafter admixing a filler with said polymer reacted with said $R_{(z-1)}MX$.

3,956,233

NON-FLAMABLE ELASTOMERIC FIBER FROM A FLUORINATED ELASTOMER AND CONTAINING AN HALOGENATED FLAME RETARDANT

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; John T. Howarth, Reading, Mass.; Suresh Sheth, Somerville, Mass.; Kenneth R. Sidman, Wayland, Mass., and Arthur A. Massucco, Natick, Mass., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed June 28, 1973, Ser. No. 374,421

Int. Cl.² C08L *27/16*

U.S. Cl. 260—45.7 R **5 Claims**

1. A flame retardant elastomeric composition suitable for forming into fibers comprising a fluorinated elastomer selected from the group consisting of polyvinylfluoride, polyvinylidenefluoride, copolymer of vinyldiene fluoride and hexafluoropropylene and mixtures thereof and a flame retardant comprising a brominated organic compound selected from the group consisting of hexabromobenzene, decarbromodiphenyl and mixtures thereof, said flame retardant being present in an amount sufficient to render said compositions substantially nonflammable in environments containing up to 70% oxygen.

3,956,234

INHIBITING OZONE DETERIORATION OF RUBBERS

Seiji Sagawa, Kawachinagano; Hideo Yamato, Minoo, and Shuichi Kanagawa, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

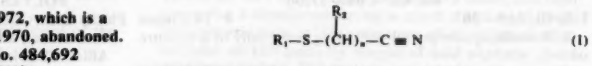
Filed Jan. 28, 1974, Ser. No. 437,219

Claims priority, application Japan, Jan. 31, 1973, 48-13099

Int. Cl.² C08J *3/20*

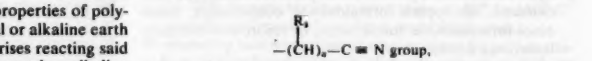
U.S. Cl. 260—45.9 R **2 Claims**

1. A method for inhibiting ozone deterioration of rubber which rubber is selected from the group consisting of natural rubber, styrene-butadiene rubber, chloroprene rubber, butadien rubber, isobutylene-isoprene rubber, isoprene rubber, nitrile-butadiene rubber and an ethylene-propylene terpolymer which comprises adding to the rubber, 0.01 to 10% based on the weight of the rubber, of a nitrile of the formula (I),



$$R_1—S—(\overset{R_2}{\overset{|}{C}}H)_a—C \equiv N \qquad (I)$$

wherein R_1 is a $C_1 - C_{18}$ alkyl, or



$$—(\overset{R_2}{\overset{|}{C}}H)_a—C \equiv N \text{ group,}$$

R_2 is a hydrogen atom, or a methyl or ethyl group, and n and a are integers of 1 to 5 with the qualification that when a is an integer of 2, then R_2 is methyl or ethyl.

3,956,235
PHOTOPOLYMERIZABLE COMPOUNDS STABILIZED AGAINST PREMATURE GELATION WITH COPPER COMPOUNDS AND THIOCARBAMATES

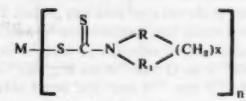
George Pasternack, Chicago, and Thor P. Jondahl, Oak Park, both of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 482,294, June 24, 1974, abandoned, which is a continuation-in-part of Ser. No. 452,227, March 18, 1974, abandoned. This application Jan. 6, 1975, Ser. No. 539,199

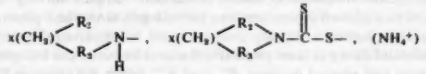
Int. Cl.² C08K 5/39

U.S. Cl. 260—45.75 C 28 Claims

1. A photopolymerizable composition comprised of an ethylenically unsaturated ester and an amount of a copper containing compound and a thiocarbamate compound sufficient to stabilize the photopolymerizable composition to gel formation, the thiocarbamate composition having the formula



wherein M is selected from the group consisting of



and a metal cation having a valence of 1 to 3 and each of R, R_1, R_2 and R_3 are selected from the group consisting of hydrogen, aryl, alkyl groups having 1 to 20 carbon atoms, aralkyl and alkaryl groups having 7 to 15 carbon atoms and amino-, sulfo- and oxy-substituted alkyl and aryl groups, *n* is an integer of 1 to 3 and *x* is an integer of 0 to 1.

3,956,236
SYNERGISTIC COMPOSITIONS FOR INCREASING FLAME RESISTANCE OF POLYMERS

Francis E. Evans, Hamburg, N.Y., and Kenneth B. Gilleo, St. Paul, Minn., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Apr. 29, 1974, Ser. No. 465,223

Int. Cl.² C08J 3/20

U.S. Cl. 260—45.85 T 9 Claims

1. A polymer selected from the group consisting of nylon, polyester and polyurethane, said polymer having from about 1 to 15 weight percent of a composition added thereto, said composition comprising:

a. from about 20 to 80 weight percent of a metal salt of a hydrocarbyl hydroxycarboxylic acid; and

b. from about 20 to 80 weight percent of a metal free organic compound selected from the group consisting of hydrocarbyl hydroxycarboxylic acids and their ammonium salts.

3,956,237
EPOXY RESIN COMPOSITIONS COMPRISING LATENT AMINE CURING AGENTS AND NOVEL ACCELERATORS

George A. Doorakian, Waltham, and Lawrence G. Duquette, Maynard, both of Mass., assignors to The Dow Chemical Company, Midland, Mich.

Filed July 8, 1974, Ser. No. 486,721

Int. Cl.² C08G 30/14

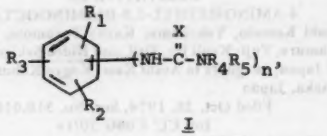
U.S. Cl. 260—47 EN 8 Claims

1. A thermally curable epoxy composition comprising

A. an epoxy resin bearing a plurality of 1,2-epoxy groups;

B. a latent amine curing agent for said epoxy resin; and

C. a small but sufficient amount of at least one sterically hindered urea or thiourea accelerator to increase the rate of reaction between (A) and (B) at elevated temperatures; said accelerator corresponding to the formula



I

wherein:

X is an atom of oxygen or sulfur;

n is 1 or 2;

R_1 is lower alkyl, chloro or bromo;

R_2 is hydrogen, lower alkyl, chloro or bromo;

R_3 is hydrogen or an inert organic radical, or

R_1 and R_3 or R_1 and R_3 can be joined to form a 5- or 6-membered carbocyclic ring;

$—NR_4R_5$ is the organic residue derived by the removal of the amino hydrogen atom from a secondary amine;

with the proviso that R_1 is located α on the benzene nucleus to at least one of the urea of thiourea substituents; and

with the proviso that when *n* is 2, I is the position isomer having the urea or thiourea substituents located α,α' on the benzene nucleus with respect to R_1, or, I is a mixture of position isomers consisting essentially of at least about 35 percent of the aforesaid α,α' position isomer and up to about 65 percent of the α,γ isomer.

3,956,238
POLYETHERQUINOXALINES

Darrell R. Heath, Overland Park, Kans., and Joseph G. Wirth, Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

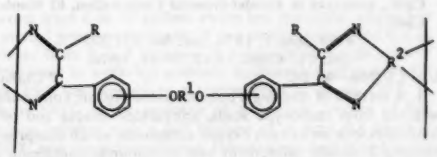
Continuation of Ser. No. 418,250, Nov. 23, 1973, Pat. No. 3,852,244. This application Aug. 26, 1974, Ser. No. 500,591

The portion of the term of this patent subsequent to Dec. 3, 1991, has been disclaimed.

Int. Cl.² C08G 73/06

U.S. Cl. 260—47 R 7 Claims

1. Moldable polymeric materials having recurring quinoxaline groups and an intrinsic viscosity of from 0.1 to 2.0 in chloroform at 25°C consisting essentially of the following chemically combined units



where R is a monovalent radical selected from hydrogen and a $C_{(1-13)}$ hydrocarbon, R^1 is a divalent aromatic radical having

from 6–30 carbon atoms, and R^2 is a tetravalent aromatic organic radical.

3,956,239

EPOXY RESIN COMPOSITION INCLUDING AMIDE DERIVATIVE OF 4-AMINOMETHYL-1,8-DIAMINOOCTANE

Hiroshi Komoto, Yokohama; Kazuo Toyomoto, Fuji; Kaoru Ohmura, Fuji; Kenji Ito, Fuji, and Hideo Sekiguchi, Fuji, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 25, 1974, Ser. No. 518,016

Int. Cl.² C08G *30/14*

U.S. Cl. 260—47 EN **15 Claims**

1. An epoxy resin composition comprising 100 parts by weight of an epoxy resin having at least 2 1,2-epoxy groups per molecule, the residue of said molecule being composed of a carbon chain or a carbon chain interrupted by an ether bond, and ester bond or an amino bond, and about 1 to 300 parts by weight of an amide derivative of 4-aminomethyl-1,8-diaminooctane.

3,956,240

NOVEL POLYKETONES

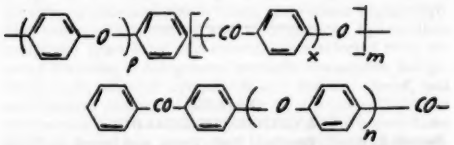
Klaus J. Dahl, Palo Alto, and Viktors Jansons, Los Gatos, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 378,616, July 12, 1973, abandoned. This application Sept. 3, 1974, Ser. No. 502,643

Int. Cl.² C08G *8/02, 10/00, 83/00*

U.S. Cl. 260—47 C **14 Claims**

1. A substantially linear crystalline polymer predominately comprised of a single repeat unit of structure



wherein each of x, m and n are 0 or 1, p is an integer from 1 to 4, n is 0 when x is 1, and wherein m is 1 and x is 0 when p is greater than 1, the inherent viscosity of said polymer being at least about 0.4 and essentially unaffected by compression molding at 410°C for 5 minutes at 10,000 p.s.i., said inherent viscosity being determined at 25°C with 0.1 gram of polymer in a 100 milliliter solution of concentrated H_2SO_4.

3,956,241

LATENT CATALYSTS FOR EPOXY RESINS

Roger Beresford Steele, Fair Oaks; Arthur Katzakian, Jr., Sacramento, and Herman H. Weyland, Morgan Hill, all of Calif., assignors to Aerojet-General Corporation, El Monte, Calif.

Filed June 7, 1974, Ser. No. 477,377

Int. Cl.² C08G *59/42, 59/44, 59/68*

U.S. Cl. 260—47 EC **7 Claims**

1. A method of reacting a polymerizable organic compound selected from carboxylic acids, anhydrides, imides and sulfonimides with an oxirane oxygen compound which comprises forming a mobile mixture of said compounds containing a catalytically effective amount of a chromium III chelate having a dissociation temperature above about 50°C and subsequently heating said mixture to above said temperature to react said compounds.

3,956,242

PREPARATION OF POLYPHENYLENE OXIDE USING A MANGANESE (II) ω-HYDROXYOXIME CHELATE REACTION PROMOTER

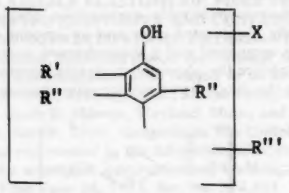
Walter K. Olander, Elnora, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed July 24, 1974, Ser. No. 491,370

Int. Cl.² C08G *65/44*

U.S. Cl. 260—47 ET **19 Claims**

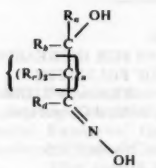
1. A process of forming self-condensation products of a phenol having the structural formula:



where X is a substituent selected from the group consisting of hydrogen, chlorine, bromine, and iodine; R′ is a monovalent constituent selected from the group consisting of hydrogen, hydrocarbon radicals, halohydrocarbon radicals having at least two carbon atoms between the halogen atoms and phenol nucleus, hydrocarbonoxy radicals, and halohydrocarbonoxy radicals having at least two carbon atoms between the halogen atoms and phenol nucleus, R″ and R‴ being the same as R′ and, in addition, halogen under reaction conditions which comprise contacting said phenol with oxygen in a basic reaction medium and in the presence of a manganese chelate complex of the formula:

$$(L)_x\,Mn\,,$$

wherein L is an ω-hydroxyoxime ligand of the formula:



wherein independently each R_a, R_b, R_c and R_d is selected from the group consisting of hydrogen, acyclic and cyclic hydrocarbon radicals, and n is a positive integer equal to 0 or 1, and x is a positive number at least equal to about 1.0.

3,956,243

PROCESS FOR FLAMEPROOFING ORGANIC FIBRE MATERIAL

Rudolf Loss, Liestal; René Berini, Birsfelden; Armin Hiestand, Binningen; Peter Hofmann, Basel, and Hermann Nachbur, Dornach, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 7, 1973, Ser. No. 422,819

Claims priority, application Switzerland, Dec. 15, 1972, 18308/72

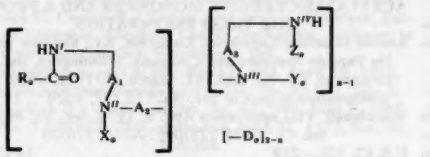
Int. Cl.² D06M *13/44*; C09K *3/28*

U.S. Cl. 260—67.6 R **25 Claims**

1. Composition for flameproofing organic fiber materials of cellulose/polyester, which essentially comprises

1. from 200 to 750 g/l of a tetrakis-(hydroxymethyl)-phosphonium compound, its self-condensation product or its condensation product with a reactive nitrogen compound,

2. from 3 to 20 g/l of an agent for imparting a soft handle, of the formula



wherein X_o and Y_o each are hydrogen, alkyl with 1 to 4 carbon atoms or $-CONH_2$, Z_o is hydrogen, alkyl with 1 to 4 carbon atoms, $-CONH_2$, $-C^{II}OR'_o$ or $-A_4-NHCO-R''_o$, A_1, A_2, A_3 and A_4 each are alkylene with 2 or 3 carbon atoms, D_o is hydrogen, $-OH$, $-NH_2$, $-NH-CO-NH_2$, $-CONH_2$, $-CO-NH-CO-NH_2$, $-(OCH_2-)_{m-1}-CO-NH-R'''_o$ or $-(OCH_2-)_{m-1}-NH-CO-R'''_o$, R_o, R'_o, R''_o and R'''_o each are alkenyl or alkyl with 9 to 23 carbon atoms, and m and n each are 1 or 2 and X_o can also be a covalent bond to C^I when H on N^I and O on C^I are omitted and there is a double bond between N^I and C^I, and Y_o can also be a covalent bond to C^{II} when Z_o is $-C^{II}OR'_o$, H on N^{IV} and O on C^{II} are omitted and there is a double bond between N^{IV} and C^{II}, these softeners being present as tertiary amines or being quaternised by alkyl halides or dialkyl sulphates which possess 1 or 2 carbon atoms per alkyl radical or halogeno-carboxylic acid alkyl esters which contain up to 4 carbon atoms in the acid part and up to 22 carbon atoms in the alcohol part or up to 60 carbon atoms if the alkyl chains are interrupted by oxygen atoms, or being in the form of acid salts of alkylcarboxylic acids with at most 4 carbon atoms, and

3. from 20 to 200 g/l of a water-soluble 1,3,5-triazine which possesses 2 to 4 methylolated amino groups.

3,956,244

CROSSLINKED VINYL ACETATE-MALEIC ANHYDRIDE HETEROPOLYMERS AND DERIVATIVES PREPARED FROM THEM

William G. Carpenter, Cranbury; Daniel F. Herman, Princeton, and Rudolph J. Berndlmaier, Allentown, all of N.J., assignors to N L Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 409,791, Oct. 26, 1973, abandoned. This application Dec. 24, 1974, Ser. No. 536,224

Int. Cl.² C08F 2/06, 218/08

U.S. Cl. 526—79 **11 Claims**

1. A process for preparing crosslinked heteropolymers of vinyl ester and maleic derivatives by combining vinyl ester monomers, maleic derivative monomers, and crosslinking agent monomers, wherein the mole ratio of vinyl ester monomers to maleic derivative monomers is from 1.1:1 to 3:1 and wherein the amount of crosslinking agent monomers is from 0.2 to 3 weight percent based on the total amount of monomers which comprises the steps of:

a. providing a vinyl ester monomer solution wherein the vinyl ester monomer solution is the reaction solution;

b. providing a maleic derivation monomer-crosslinking agent monomer solution;

c. providing a catalyst solution;

d. adding an amount of the maleic derivative monomer-crosslinking agent monomer solution to the reaction solution to form a polymerizable solution wherein the added amount is such that the unreacted amounts of the maleic derivative monomer and cross-linking agent monomer in the reaction solution do not exceed 1/15th of the total amounts to be added.

e. adding an amount of catalyst solution wherein the added amount is sufficient to promote heteropolymerization but in an insufficient amount to promote homopolymerization of the vinyl ester;

f. polymerizing the reaction solution at a polymerizable temperature; and

g. repeating steps (d), (e), and (f) until all the maleic derivative monomers, crosslinking agent monomers, and catalyst has been added and the heteropolymer formed wherein the mole ratio of the combined vinyl ester to combined maleic derivatives in the heteropolymer is from 1.1:1 to 3:1.

3,956,245

BULK COPOLYMERIZATION OF VINYL ESTER

Adrianus M. C. Van Steenis, and William J. Van Westrenen, both of Delft, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Apr. 23, 1974, Ser. No. 463,329

Claims priority, application United Kingdom, May 9, 1973, 22144/73

Int. Cl.² C08F 2/02, 218/19

U.S. Cl. 260—878 R **3 Claims**

1. In the process for copolymerizing vinyl esters and α-alkenyl aromatic hydrocarbons where optionally the following monomers are also present;

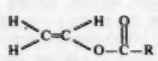
A. an ester, amide, and/or nitrile of an ethylenically unsaturated monocarboxylic acid having 3 to 4 carbon atoms per molecule,

B. an ester of an ethylenically unsaturated dicarboxylic acid having 4–5 carbon atoms per molecule,

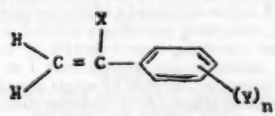
C. an ethylenically unsaturated mono- or dicarboxylic acid, or anhydride thereof, having 3–5 carbon atoms per molecule, and

D. a mono-ethylenically unsaturated polyisobutylene having a number average molecular weight between about 2000 and about 8000,

the improvement which comprises a bulk free radically initiated process in which 20–50 parts by weight of a vinyl ester having the formula:



where R is a saturated hydrocarbon having from 9–19 carbon atoms, the carbon atom attached to the carboxyl function being tertiary or quaternary and 10–90 parts by weight of an α-alkenyl aromatic hydrocarbon having the formula:



having from 8 to 10 carbon atoms per molecule, where X is a methyl group or hydrogen, Y is a methyl group, and n is an integer from 0 to 2 inclusive in a calculated weight ratio of vinyl ester to α-alkenyl aromatic hydrocarbon of at least, below 25:1 are brought to a temperature of about 150°C to about 200°C in the presence of a catalytic amount of free radical initiator with a half lifetime of at least 0.4 hours at 150°C and the polymerization temperature maintained in the 150° to 200°C range by the combination of heating, cooling and retarding the polymerization by the gradual addition of α-alkenyl aromatic hydrocarbon together with a catalytic amount of said free radical initiator over a 4–24 hour period.

3,956,246
MANUFACTURE OF IMPACT-RESISTANT OLEFINIC-NITRILE COPOLYMERS

Russell K. Griffith, Chagrin Falls, and John F. Jones, Cuyahoga Falls, both of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Filed May 4, 1972, Ser. No. 250,125
Int. Cl.² C08F *2/18, 2/22*
U.S. Cl. 526—338 **7 Claims**

1. The process comprising polymerising in an aqueous medium in the substantial absence of oxygen at a temperature in the range of from about 0° to 100°C to at least 70% by weight conversion of 100 parts by weight of a monomer component comprising

A. from about 70 to 95% by weight of methacrylonitrile and

B. from about 5 to 30% by weight based on the combined weights of (A) plus (B) of styrene and then including in the polymerization from 1 to 40 parts by weight per 100 parts by weight of (A) plus (B) of

C. from about 70 to 100% by weight of at least one conjugated diene monomer selected from the group consisting of butadiene-1,3 and isoprene and

D. from about 0 to 30% by weight based on the combined weights of (C) plus (D) of at least one member selected from the group consisting of styrene and methacrylonitrile

and continuing the polymerization to a final conversion of from about 80 to 100% by weight of monomers to polymer.

3,956,247
HALOGENATION OF EPDM IN SOLUTION IN THE PRESENCE OF EPOXIDE AND, OPTIONALLY, POLY(ALKYLENE ETHER) GLYCOL

Vincent Russell Landi, Cheshire, and Eliot K. Easterbrook, Naugatuck, both of Conn., assignors to Uniroyal Inc., New York, N.Y.

Filed Jan. 15, 1975, Ser. No. 541,173
Int. Cl.² C08F *210/00*
U.S. Cl. 526—42 **32 Claims**

1. A method of halogenating an elastomeric, unsaturated, vulcanizable terpolymer of ethylene, an alpha-monoolefin having 3 to 8 carbon atoms and a copolymerizable non-conjugated diene, comprising providing a solution of said terpolymer in an inert organic solvent, adding to said solution a halogen selected from the group consisting of chlorine, bromine, iodine and their interhalogen compounds, and an epoxide, subjecting the solution to a temperature within the range of from −30 to 100°C, whereby the said terpolymer becomes halogenated in the presence of said epoxide, and thereafter recovering from the solution a halogenated terpolymer characterized by viscosity stability and low gel content.

16. A method of halogenating an elastomeric, unsaturated, vulcanizable terpolymer of ethylene, an alpha-monoolefin having 3 to 8 carbon atoms and a copolymerizable non-conjugated diene, comprising providing a solution in an inert organic solvent containing from 3 to 15% by weight of said terpolymer, adding to said solution from 1 to 10 parts by weight of halogen per 100 parts by weight of said terpolymer, said halogen being selected from the group consisting of chlorine, bromine, iodine and their interhalogen compounds, and an epoxide selected from the group consisting of epoxidized soybean oil, epoxidized higher fatty acid ester, epoxide of a diolefin polymer, bisphenol A-epichlorohydrin reaction product, and epoxide of a monomeric olefinically unsaturated hydrocarbon in amount sufficient to provide from 0.05 to 2 moles of epoxide group per gram atom of halogen present, subjecting the resulting solution to a temperature of from 20° to 80°C. in the absence or near absence of light, whereby the said terpolymer becomes halogenated in the presence of said epoxide, and thereafter recovering from the solution a halogenated terpolymer containing from 0.25% to 10% halogen by weight, characterized by viscosity stability and low gel content.

3,956,248
ALTERNATING COPOLYMERS OF ETHYLENE/ALKYL ACRYLATES/CURE-SITE MONOMERS AND A PROCESS FOR THEIR PREPARATION

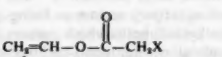
Anestis Leonidas Logothetis, Louisville, Ky., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 233,741, March 10, 1972, which is a continuation-in-part of Ser. No. 132,177, April 7, 1971, abandoned. This application Aug. 8, 1974, Ser. No. 495,797
Int. Cl.² C08F *218/00, 220/00, 210/00*
U.S. Cl. 526—219 **14 Claims**

1. An amorphous substantially linear atactic alternting copolymer having a glass transition temperature less than about 0°C. and an inherent viscosity of about 1–6 (measured on a 0.1 wt. % solution in chloroform at 30°C.), said copolymer having repeating units of:

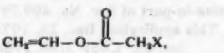
-A-B-

wherein A is independently selected from at least one alkyl acrylate, said alkyl group having from 1–8 carbon atoms and B is independently selected from ethylene and an alpha-olefinic cure-site monomer having the formula:



where X is Cl, Br, or F; and further, mole % ethylene plus curesite monomer in the copolymer is about 50, the balance being alkyl acrylate.

5. A process for preparing an amorphous substantially linear atactic alternating copolymer having a glass transition temperature less than about 0°C. and an inherent viscosity of about 1–6 (measured on a 0.1 wt. % solution in chloroform at 30°C.), said copolymer having units derived from at least one alkyl acrylate, said alkyl group having from 1–8 carbon atoms, ethylene units, and about 1–10mole % based on the copolymer of units derived from a curesite monomer, the process consisting essentially of reacting in solution in an inert solvent about 1–20 mole % of the alkyl acrylate based on moles of solvent, with ethylene and an effective amount of a cure-site monomer having the formula:



at a temperature of about −10°C. to about 200°C., in the presence of boron trifluoride at pressures sufficient to keep said alkyl acrylate complexed with boron trifluoride, and about 0.5–5.0 parts for every 100 parts by weight of alkyl acrylate of a free-radical polymerization initiator, and isolting the copolymer formed in the resulting reaction mass.

3,956,249
MANUFACTURE OF POLYVINYL CHLORIDE OF LOW VINYL CHLORIDE MONOMER CONTENT BY TREATMENT OF WET POLYVINYL CHLORIDE

Donald Goodman, Flemington; Robert S. Miller, Bridgewater, and Robert J. Stanaback, Gladstone, all of N.J., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed June 24, 1974, Ser. No. 482,114
Int. Cl.² C08F *214/06, 220/40, 6/00*
U.S. Cl. 528—500 **7 Claims**

1. In suspension and emulsion polymerization processes for the production of vinyl chloride polymers selected from the group consisting of polyvinyl chloride and copolymers of vinyl chloride and at least one monomer copolymerizable therewith wherein a wet cake consisting essentially of said vinyl chloride polymer, water, and vinyl chloride is formed and vinyl chloride is separated from said wet cake, the improvement that comprises removing vinyl chloride from the wet cake by contacting the wet cake with steam.

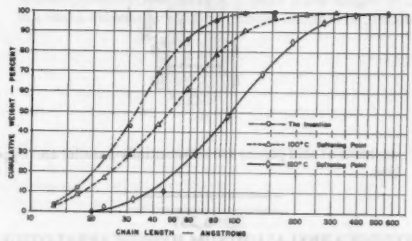
3,956,250
ALPHA METHYL STYRENE AND VINYL TOLUENE AND PROCESSES OF PREPARATION

Clarence C. Campbell, Clairton, and Dean A. Finfinger, Forward Township, Allegheny County, both of Pa., assignors to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 135,492, April 19, 1971, which is a continuation-in-part of Ser. No. 52,139, July 2, 1970, which is a division of Ser. No. 831,540, June 9, 1969, Pat. No. 3,630,981. This application June 26, 1972, Ser. No. 266,386

Int. Cl.[2] **C08F** *210/00, 212/00*

U.S. Cl. 526—194 **3 Claims**



1. A process for preparing copolymers of alpha methyl styrene and vinyl toluene having softening points in the range of 25°C. to 98°C. which comprises subjecting a mixture of monomers consisting essentially of 2.5 to 4.5 parts by weight of vinyl toluene and 1 part by weight of alpha methyl styrene in an inert diluent to the catalytic action of acid clay, maintaining the temperature of the reaction mixture in the range of 5° to 80°C., and recovering the product of the reaction.

3. A process for preparing copolymers of alpha methyl styrene and vinyl toluene having softening points under about 98°C. which comprises subjecting a mixture of monomers consisting essentially of 2.5 to 4.5 parts by weight of vinyl toluene and 1 part by weight of alpha methyl styrene in an inert diluent to the catalytic action of acid clay, heating the mixture to a temperature above the reaction temperature, controlling the temperature of the reaction mixture in the range of 5°C. to 80°C., and thereafter recovering the reaction product.

3,956,251
METHOD FOR PREPARING VINYL HALIDE HOMOPOLYMERS HAVING IMPROVED PROCESSING CHARACTERISTICS

Leonard Feiler, Spring Valley, N.Y., and Sheldon F. Gelman, Danbury, Conn., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 756,309, Aug. 29, 1968, abandoned, which is a continuation of Ser. No. 174,250, Aug. 23, 1971. This application June 19, 1970, Ser. No. 47,885

Int. Cl.[2] **C08F** *1/11, 1/80, 3/30*

U.S. Cl. 526—73 **18 Claims**

1. A method for preparing polyvinyl chloride exhibiting improved processing characteristics, said method comprising the steps of:

1. initiating the free radical suspension polymerization of vinyl chloride monomer in an aqueous medium containing an effective concentration of a suspending agent and in the presence of an effective concentration of a hot free radical initiating catalyst having a 10 hour half-life at a temperature of below about 55° C., said polymerization reaction being conducted at an initial temperature level until a degree of conversion of from about 10 to about 60% is attained; and thereupon
2. raising the temperature of the system to an increased level with respect to the initial temperature of the system during step (1) and introducing into the system at the initiation of step (2) an effective concentration of a conventional catalyst, said temperature being maintained at this increased level until the completion of the polymerization reaction, thereby yielding a vinyl chloride homopolymer displaying improved processing characteristics.

8. A method for preparing polyvinyl chloride exhibiting improved processing characteristics said method comprising the steps of:

1. initiating the free radical, suspension polymerization of vinyl chloride monomer in an aqueous medium containing an effective concentration of a suspending agent and in the presence of an effective concentration of a free radical initiating catalyst, said polymerization reaction being conducted at an initial temperature level until a degree of conversion of from about 10 to 60% is attained and thereupon
2. raising the temperature of the system to an increased level with respect to the initial temperature of the system during step (1) and maintaining the temperature at this increased level until the completion of the polymerization reaction; and,
3. introducing an effective concentration of a chain transfer agent into the system essentially simultaneous with the raising of the polymerization temperature in step (2) so as to have said chain transfer agent present in the system throughout the time said polymerization reaction is being run to completion at said increased temperataure level; thereby yielding a vinyl chloride homopolymer displaying improved processing characteristics.

3,956,252
METHOD FOR PREVENTING FOULING IN THE POLYMERIZATION OF OLEFINS

Shigeru Saeda, and Yukinori Suzaka, both of Oita, Japan, assignors to Showa Denku K.K., Tokyo, Japan

Filed Aug. 4, 1975, Ser. No. 601,604

Claims priority, application Japan, Aug. 12, 1974, 49-91476

Int. Cl.[2] **C08F** *2/14, 4/24, 4/60, 10/00*

U.S. Cl. 526—74 **10 Claims**

1. In the slurry polymerization of olefins in a solvent in the presence of a catalyst, a method for preventing the catalyst particles and the resulting polymer particles from depositing on the inner wall surface of a polymerization reactor which comprises causing a small amount of an anti-fouling agent to be present in the reaction system, the anti-fouling agent being either (a) at least one basic nitrogen-containing salt of phytic acid, or (b) a mixture of said phytic acid salt and at least one alkali metal salt of an organic acid selected from the group consisting of organic carboxylic acids, organic sulfonic acids, partial alkyl esters of organic polycarboxylic acids and alkyl esters of organic sulfocarboxylic acids, said organic acids containing 1 to 30 carbon atoms per molecule, said alkyl in the alkyl esters containing 1 to 22 carbon atoms and said alkali metal salt being soluble in the solvent.

3,956,253
POLYETHYLENE MOLDING COMPOUNDS OF HIGH-WEAR RESISTANCE

Gunther Braun, Oberhausen, Germany, assignor to Ruhrchemie Aktiengesellschaft, Oberhausen, Germany

Continuation of Ser. No. 396,442, Sept. 12, 1973, abandoned. This application Sept. 5, 1975, Ser. No. 610,657

Claims priority, application Germany, Sept. 16, 1972, 2245552

Int. Cl.[2] **C08F** *8/06, 8/06*

U.S. Cl. 526—352 **14 Claims**

1. A method for preparing a polyethylene composition having high wear resistance which comprises

homogeneously mixing a peroxide cross-linking agent with a polyethylene powder having a viscosimetrically determined molecular weight of at least 1,000,000, said cross-

linking agent being present in an amount of 0.2 to 0.6% by weight

pre-compressing the mixture at pressure of at least 50 kp/cm² to obtain a pre-compressed polyethylene mixture,

plasticizing the mixtue at a temperature of at least about 200°C at a pressure of at least 50 kp/cm², and

cooling the plasticized mixture to obtain the polyethylene composition of high wear resistance.

3,956,254

THERMOPLASTIC CRYSTALLINE FREE FILMS

Daniel R. St. Eve, Thornhill, and Ajit Kumar Bose, Don Mills, both of Canada, assignors to Leco Industries Limited, Rexdale, Canada

Continuation-in-part of Ser. Nos. 79,754, Oct. 12, 1970, Pat. No. 3,754,067, and Ser. No. 359,563, May 11, 1973, Pat. No. 3,888,609. This application May 21, 1974, Ser. No. 471,873

Int. Cl.² C08F *6/00, 110/02*; C08J *5/18*

U.S. Cl. 526—352 **10 Claims**

1. Blown tube extruded low and medium density polyethylene being characterized by a tensile strength average of the machine and transverse directions of at least 2800 psi, haze properties as measured by ASTM D-1003-61 of less than about 4% and gloss characteristics as measured by ASTM D-523-53T of at lease 115.

3,956,255

CATALYST FOR THE POLYMERIZATION OF OLEFINS

Morris R. Ort, Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 429,986, Jan. 2, 1974, abandoned. This application June 5, 1974, Ser. No. 476,746

Int. Cl.² C08F *4/02, 10/02*

U.S. Cl. 526—352 **10 Claims**

1. An improved catalyst for the polymerization and copolymerization of ethylene in the presence of hydrogen as a molecular weight control agent consisting essentially of (1) a composition prepared by combining a compound of vanadium with an alkylaluminum alkoxide of the formula $R_nAl(OR)_{3-n}$ wherein R is a hydrocarbyl group containing from 1 to 12 carbon atoms and n varies from 0.5 to 2 inclusive and mixtures of such compounds, and thereafter combining the resulting reaction mixture with a trialkylaluminum, the molar ratio of said trialkylaluminum to said compound of vanadium being in the range from 0.3:1 to 1000:1 and said alkoxide-to-vanadium molar ratio being in the range from 1:10 to about 100:1, and (2) a support on which said composition is deposited consisting of silica gel which has been reacted with an alkylaluminum compound chosen from the group consisting of (1) R_nAlX_{3-n} wherein R is an alkyl radical having from 1 to 12 carbon atoms, X is a halogen and *n* is 1, 2 or 3 and mixtures thereof and (2) compounds of the formula $R_nAl(OR)_{3-n}$ wherein R is an alkyl radical having from 1 to 12 carbon atoms and *n* is 1 or 2 and mixtures thereof.

3,956,256

PROCESS FOR POLYMERIZING ETHENE AT HIGH PRESSURE AND TEMPERATURE

Frederik J. P. J. Mercx, Stein, Netherlands, assignor to Stamicarbon B.V., Geleen, Netherlands

Filed Sept. 12, 1974, Ser. No. 505,605

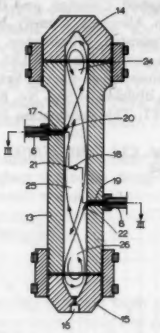
Claims priority, application Netherlands, Sept. 18, 1973, 7312804

Int. Cl.² C08F *10/02*; B01J *3/04*

U.S. Cl. 526—64 **15 Claims**

1. In a process for the continuous polymerization of ethene at high pressure and temperature in a cylindrical autoclave in the presence of an initiator which comprises feeding ethene into the autoclave at a high velocity, the improvement which comprises:

feeding the ethene into the autoclave in at least two places, at an angle which is acute to the central axis of said autoclave such that the directions of flow of the ethene



currents at said places are substantially parallel and opposite.

3,956,257

HYDROCARBYLALUMINUM HYDROCARBYLOXIDE ANTIFOULING AGENT IN OLEFIN POLYMERIZATION PROCESS

John P. Hogan, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 14, 1975, Ser. No. 604,757

Int. Cl.² C08F *2/14, 4/52, 10/00, 10/02*

U.S. Cl. 526—64 **10 Claims**

1. A process for producing polymer wherein at least one mono-1-olefin having 2 to 8 carbon atoms per molecule is introduced into a reaction zone along with a supported chromium-containing catalyst and diluent and the resulting reaction mixture is mixed therein, this mixing being carried out at a temperature such that polymer thus produced is insoluble in said diluent, the improvement comprising: adding a hydrocarbylaluminum hydrocarbyloxide having the formula $R_nAl(OR)_{3-n}$ wherein n is an integer of 1 to 2 and R is an alkyl, cycloalkyl or aromatic radical having from 1 to 14 carbon atoms, to said zone via a stream separate from that used to introduce said catalyst so as to avoid contact between said catalyst and said hydrocarbylaluminum hydrocarbyloxide prior to contact with said reaction medium, said hydrocarbylaluminum hydrocarbyloxide being added in an amount effective to reduce reactor fouling.

3,956,258

CARCINOEMBRYONIC ANTIGENS

Hans John Hansen, Allendale, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 252,700, May 12, 1972, Pat. No. 3,867,363, which is a continuation-in-part of Ser. No. 133,404, April 12, 1971, Pat. No. 3,697,638, which is a continuation-in-part of Ser. No. 110,288, Jan. 27, 1971, abandoned, which is a continuation-in-part of Ser. No. 42,526, June 1, 1970, abandoned. This application May 13, 1974, Ser. No. 469,197

Int. Cl.² C07G *7/00*

U.S. Cl. 260—112 R **3 Claims**

1. A process for producing human carcinoembryonic antigen material, human carcinoembryonic antigen component A or human carcinoembryonic antigen component B which comprises

a. homogenizing adenocarcinoma tissue;

b. separating the solid particles from the homogenate;

c. treating the supernatant with a glycoprotein solvent in which the carcinoembryonic antigen material, component A or component B is soluble;

d. separating the precipitate and clarifying the resulting solution;
e. dialyzing the clarified solution against a polyethylene glycol with an average molecular weight of about 15,000 to 20,000 and a softening point at 60°C.;
f. dissolving the retentate in an aqueous buffer of pH from about 5 to 9;
g. subjecting the resulting material to sequential chromatography on two different gel columns, the first of which is an agarose gel having about 6% by weight agarose and a particle size of from 40 to 210 microns and the second of which is a hydrophilic water-insoluble cross-linked dextran polymer gel;
h. collecting and concentrating the eluates which have a spectrophotometric absorption peak wave length of 280 mμ and a molecular weight of about 200,000 to 500,000.

3,956,259

FRACTIONATION OF BLOOD USING BLOCK COPOLYMER OF ETHYLENE OXIDE AND POLYOXYPROPYLENE POLYMER TO RECOVER FRACTION SUITABLE FOR ORGAN PERFUSATE

Luis A. Garcia, Huntington Beach, and Guido A. Ordonez, Laguna Beach, both of Calif., assignors to Baxter Laboratories, Inc., Deerfield, Ill.

Division of Ser. No. 327,893, Jan. 30, 1973. This application June 6, 1974, Ser. No. 476,961
Int. Cl.² C07G *7/00*
U.S. Cl. 260—112 B **2 Claims**

1. The process of preparing a blood fraction suitable for use as an organ perfusate from coagulation factor-depleted blood serum and plasma comprising selective precipitation by admixing with from about 2% to about 12% of a compound of the formula

$$HO(CH_2CH_2O)_a(\underset{\underset{CH_3}{|}}{CHCH_2O})_b(CH_2CH_2O)_cH$$

wherein *a* and *c* are integers such that the hydrophile portion represented by (CH_2CH_2O) constitutes at least about 50% of the molecule and *b* is an integer such that the hydrophobic portion represented by

$$(\underset{\underset{CH_3}{|}}{CHCH_2O})$$

has a molecular weight of at least about 950 at a pH from about 4 to 5, separating the resulting precipitate from the supernatant and then adjusting the concentration of said copolymer in said supernatant to from about 14% to about 24% and adjusting to a pH of from about 4 to about 5 with acetate buffer at a temperature of from about 0° C to about 10° C to provide a precipitate for reconstitution to the desired organ perfusate.

3,956,260

HYPOCALCAEMIC PEPTIDES AND PROCESSES FOR THEIR MANUFACTURE

Max Brugger, Birsfelden; Friedrich Werner Kahnt; Bruno Kamber, both of Basel; Robert Neher, Binningen; Bernhard Riniker, Frenkendorf; Werner Rittel, Basel; Peter Sieber, Reinach, Basel-Land; Herbert Zuber, Zurich, Glattbrugg, all of Switzerland, and Hendrik Marie Greven, Heesch, Netherlands, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 773,472, Nov. 5, 1968, abandoned. This application Dec. 10, 1971, Ser. No. 206,933
Claims priority, application Switzerland, Nov. 9, 1967, 15661/67; Feb. 6, 1968, 1763/68; Apr. 29, 1968, 6347/68; May 4, 1968, 6666/68; May 10, 1968, 6669/68; May 21, 1968, 7509/68
Int. Cl.² C07C *103/52*; C07G *7/00*
U.S. Cl. 260—112.5 T **1 Claim**

1. A peptide of the formula I

H-L-Cys-L-Ser-L-X-L-Leu-L-Ser-L-Thr-L-Cys-L-Val-L-Leu-L-Ser-L-Ala-L-Tyr-L-Arg-L-X-Leu-L-X-L-X-L-Phe-L-His-L-Arg-L-Phe-L-Ser-Gly-L-Z-Gly-L-Phe-Gly-L-Pro-L-Y-L-Thr-L-Pro-NH_2

in which X is a member selected from the group consisting of aspartyl and asparaginyl, Y is a member selected from the group consisting of glutamyl and glutaminyl and Z is a member selected from the group consisting of methionyl, valyl, norvalyl, leucyl, isoleucyl, and norleucyl, a Met^{25}-sulfoxide, N acyl derivative or N -desamino derivative thereof with the exception of

H-Cys-Ser-Asn-Leu-Ser-Thr-Cys-Val-Leu-Ser-Ala-Tyr-Try-Arg-Asn-Leu-Asn-Asn-Phe-His-Arg-Phe-Ser-Gly-Met-Gly-Phe-Gly-Pro-Glu-Thr-Pro-NH_2

and its Met^{25}-sulfoxide, or a therapeutically acceptable acid addition salt thereof.

3,956,261

LIGNIN ADDUCTS

Stephen Y. Lin, Mt. Pleasant, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed Oct. 10, 1975, Ser. No. 621,466
Int. Cl.² C07G *1/00*
U.S. Cl. 260—124 A **6 Claims**

1. Lignin dicarboxylate comprising,
the reaction product of lignin and from an effective amount up to about 10 moles of an alkali metal salt of epoxy-succinate per 1,000 grams of lignin.

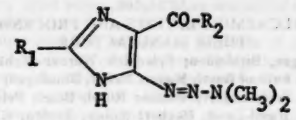
3,956,262

TRIAZENOIMIDAZOLES

James Heyes, Peaslake, and Neal Ward, Walton-on-the Hill, both of England, assignors to Beecham Group Limited, United Kingdom

Continuation of Ser. No. 205,345, Dec. 6, 1971, abandoned. This application Nov. 27, 1974, Ser. No. 527,655
Claims priority, application United Kingdom, Dec. 9, 1970, 58385/70
Int. Cl.² A01N *9/20*; A61K *31/655*; A61L *9/00*; C07C *107/00*
U.S. Cl. 260—140 R **5 Claims**

1. A compound of the formula



wherein

R_1 is phenyl; and

R_2 is methoxy, ethoxyl, n-propoxyl, or isopropoxyl, or a pharmaceutically acceptable, montoxic acid addition salt or monohydrate thereof.

3,956,263

4-METHYL-2,6-DIHYDROXY-3-CYANOPYRIDINE CONTAINING DYESTUFFS

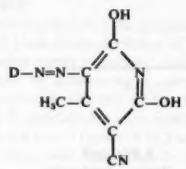
Arthur Buehler, Rheinfelden; Alfred Fasciati, Bottmingen, and Gerd Hoelzie, Liestal, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 200,210, Nov. 18, 1971, abandoned, which is a continuation of Ser. No. 840,036, July 8, 1969, abandoned. This application Nov. 1, 1973, Ser. No. 411,623

Int. Cl.² C09B *45/16, 45/18, 45/20, 45/22*

U.S. Cl. 260—146 R **5 Claims**

1. A water-soluble copper-, chromium-, cobalt-, or nickel-complex of a dyestuff of the formula



wherein D is benzene or naphthalene which is

a. substituted in the ortho position to the azo group by carboxy, hydroxy, or methoxy, and

b. substituted by at least one sulphonic acid group and

c. is further unsubstituted or substituted by hydroxy, methoxy, acetylamino, chloro, nitro, cyano, benzoylamino, carboxy, 3-sulphophenylazo, amino, methyl, 4,8-disulphonapthylazo or 4-methyl-3-sulphobenzenesulphonyl.

3,956,264

BASIC AZO DYESTUFFS HAVING INDOLYL-METHYLENEAMINO SUBSTITUENT IN THE DIAZO COMPONENT

Roderich Raue, and Hans-Peter Kuhlthau, both of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

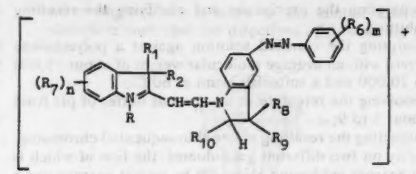
Filed July 13, 1973, Ser. No. 378,809

Claims priority, application Germany, July 13, 1972, 2234468

Int. Cl.² C09B *43/00*

U.S. Cl. 260—155 **8 Claims**

1. Dyestuff of the formula



wherein

R denotes hydrogen, alkyl with 1–6 C-atoms, trifluoromethyl, chloroethyl, bromoethyl, hydroxyethyl, methoxyethyl, cyanoethyl, acetoxyethyl, aminocarbonylethyl, allyl, methallyl, chloroallyl, propargyl, phenyl, methylphenyl, chlorophenyl, naphthyl, benzyl, phenylethyl, or phenylpropyl-(2,2);

R_1 denotes alkyl with 1–6 C-atoms, trifluoromethyl, chloroethyl, bromoethyl, hydroxyethyl, methoxyethyl, cyanoethyl, acetoxyethyl, aminocarbonylethyl, allyl, methallyl, chloroallyl, propargyl, benzyl, phenylethyl or phenylpropyl-(2,2) or cyclohexyl;

R_2 denotes alkyl with 1–6 C-atoms, trifluoromethyl, chloroethyl, bromoethyl, hydroxyethyl, methoxyethoxy, cyanoethyl, acetoxyethyl, aminocarbonylethyl, allyl, methallyl, chloroallyl, propargyl, benzyl, phenylethyl, phenylpropyl-(2,2) or cyclohexyl;

R_6 and R_7 represent fluoro, chloro, bromo, C_1-C_6-alkyl, trifluoromethyl, chloroethyl, bromoethyl, hydroxyethyl, methoxyethyl, cyanoethyl, acetoxyethyl, aminocarbonylethyl, allyl, methallyl, chloroallyl, propargyl, cyclohexyl, benzyl, phenylethyl, phenylpropyl-(2,2), hydroxyl, alkoxy of 1–4 carbon atoms, phenyloxy, naphthyloxy, benzyloxy, phenylethyloxy, phenylpropyl-(2,2)-oxycarbonyl, cyano, amino, carbamoyl, N-C_1-C_6-alkylcarbamoyl, N,N-di-C_1-C_6-alkylcarbamoyl, N-C_1-C_6-alkyl-N-phenylcarbamoyl, N-C_1-C_6-alkyl-N-methylphenylcarbamoyl, N-C_1-C_6-alkyl-N-chlorophenylcarbamoyl, N-C_1-C_6-alkyl-N-naphthylcarbamoyl, sulphamoyl, N-C_1-C_6-alkylsulphamoyl, N,N-di-C_1-C_6-alkylsulphamoyl, C_1-C_6-alkylsulphonyl, phenylsulphonyl, methylphenylsulphonyl, chlorophenylsulphonyl, or naphthylsulphonyl;

R_8, in addition denotes phenylazo, methylphenylazo, chlorophenylazo, or naphthylazo;

R_7, in addition, denotes carboxyl;

R_8 and R_9 represent hydrogen, C_1-C_6-alkyl, trifluoromethyl, chloroethyl, bromoethyl, hydroxyethyl, methoxyethyl, cyanoethyl, acetoxyethyl, aminocarbonylethyl, allyl, methallyl, chloroallyl, benzyl, phenylethyl, phenylpropyl-(2,2), or propargyl;

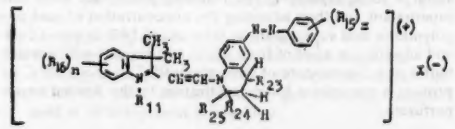
R_{10} represents hydrogen or C_1-C_6-alkyl;

R_9 and R_{10} when joined together additionally represent a carbocyclic ring;

m and *n* represent the numbers 0, 1, 2, or 3; and

$X^{(-)}$ represents an anion.

3. Dyestuff of the formula



wherein

R_{11} denotes methyl, ethyl, n-propyl, i-propyl, n-butyl, β-chloroethyl, β-hydroxyethyl, β-cyanoethyl, β-methoxyethyl, β-bromoethyl, β-acetoxyethyl, allyl, or benzyl;

R_{15} denotes fluoro, chloro, bromo, C_1-C_4-alkyl, cyclohexyl, hydroxyl, methoxy, ethoxy, phenoxy, benzyloxy, nitro, cyano, acetylamino, carbamoyl, sulphamoyl, methylsulphonyl, or trifluoromethyl;

R_{16} denotes fluoro, chloro, bromo, C_1-C_4-alkyl, cyclohexyl, benzyl, methoxy, ethoxy, phenoxy, benzyloxy, nitro, methoxycarbonyl, benzyloxycarbonyl, carboxyl, cyano, acetylamino, amino, carbamoyl, sulphamoyl, methylsulphonyl or trifluoromethyl;

R_{23} denotes hydrogen or methyl,

R_{24} denotes hydrogen or methyl and

R_{25} denotes hydrogen or methyl,

m and *n* denote the numbers 0, 1, 2, or 3; and

$X^{(-)}$ denotes an anion.

3,956,265

MONOAZO HYDROXY PYRIDONE DYESTUFFS CONTAINING A METHYLENE PIPERIDINO GROUP

John Lindley Leng, and David Frederick Newton, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Dec. 17, 1973, Ser. No. 425,283

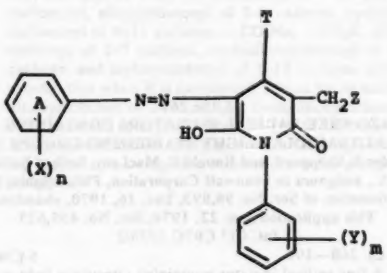
Claims priority, application United Kingdom, Dec. 27, 1972, 59620/72

Int. Cl.² C09B 29/36; D06P 3/24, 3/52, 3/70

U.S. Cl. 260—156 **10 Claims**

1. Azo dyestuff free from carboxylic acid or sulphonic acid groups selected from the group consisting of

a. a dyestuff of the formula



wherein

X is chlorine, bromine, iodine, $-COOCH_3$, $-COOC_2H_5$, $-COCH_3$, $-COC_6H_5$, $-COC_2H_5$, cyano or trifluoromethyl,

Y is hydrogen, methyl, ethyl, methoxy, ethoxy, chlorine, bromine, nitro, cyano, $-COOCH_3$, $-COOC_2H_5$, $-COCH_3$, $-COC_2H_5$, trifluoromethyl or alkylene forming with the phenyl ring 1-naphthyl,

Z is

T is lower alkyl or phenyl,

the ring A can be substituted with $(X)_n$ alone or further substituted with lower alkyl or methoxy,

m is 1 or 2 and

n is 1 or 2 and

b. a salt of the dyestuff of (a) with an acid selected from the group consisting of hydrochloric acid, sulfuric acid, phosphoric acid, sulphamic acid, boric acid, formic acid, acetic acid, propionic acid, citric acid, oxalic acid and mono-, di- and tri-chloracetic acid.

3,956,266

BIS-(BENZIMIDAZOLONE-AZO-ACETOACETYLAMINO)-PHENYLENE PIGMENTS

Rudolf Mory, Dornach, and Stefan Hari, Allschwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

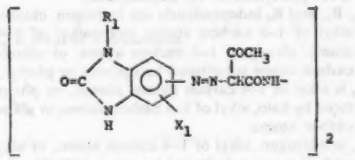
Filed Oct. 21, 1974, Ser. No. 516,528

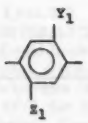
Claims priority, application Switzerland, Oct. 30, 1973, 15249/73

Int. Cl.² C09B 33/14; D06P 3/00, 3/24, 3/52

U.S. Cl. 260—157 **1 Claim**

1. A disazo pigment of the formula





wherein R_1 is hydrogen, alkyl containing 1–4 carbon atoms, cycloalkyl containing 5–6 carbon atoms, phenyl, phenyl substituted by chloro, bromo, alkyl containing 1–4 carbon atoms, or alkoxy containing 1–4 carbon atoms; X_1 is hydrogen, chloro, bromo, alkyl containing 1–4 carbon atoms, alkoxy containing 1–4 carbon atoms or phenoxy; and Y_1 and Z_1 are hydrogen, chloro, bromo, alkyl containing 1–4 carbon atoms, or alkoxy containing 1–4 carbon atoms.

3,956,267

INDOLE-CONTAINING DISAZO DYESTUFFS HAVING A SULFATOALKYLENEOXY-SUBSTITUENT

Richard Sommer, Leverkusen; Gerhard Wolfrum, Bergisch-Neukirchen, and Karl-Ludwig Moritz, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

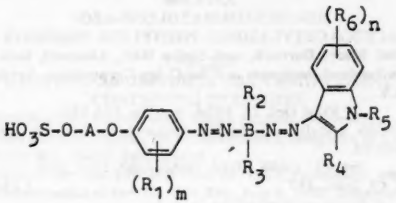
Continuation of Ser. No. 231,729, March 3, 1972, abandoned. This application Nov. 15, 1974, Ser. No. 524,268

Claims priority, application Germany, Mar. 4, 1971, 2110230

Int. Cl.² C09B *31/14, 33/12;* D06P *3/06, 3/24*

U.S. Cl. 260—165 11 Claims

1. Disazo dyestuff which in the form of the free acid corresponds to the formula



wherein

A is alkylene of 2–5 carbon atoms;

B is 1,4-phenylene or 1,4-naphthylene;

R_1, R_2, and R_3 independently are hydrogen, chloro, bromo, alkyl of 1–4 carbon atoms, cyanoalkyl of 1–4 carbon atoms, alkoxy of 1–6 carbon atoms, or alkoxy of 1–6 carbon atoms substituted by hydroxy or phenyl;

R_4 is alkyl of 1–4 carbon atoms, phenyl., or phenyl substituted by halo, alkyl of 1–4 carbon atoms, or alkoxy of 1–4 carbon atoms;

R_5 is hydrogen, alkyl of 1–4 carbon atoms, or alkyl of 1–4 carbon atoms substituted by cyano, $CONH_2$ of carboxy;

R_6 is alkyl of 1–4 carbon atoms alkoxy of 1–6 carbon atoms, chloro, bromo, or fluoro, nitro, sulfo, or cyano;

m is a number from 1 to 4; and

n is a number from 0 to 2.

3,956,268

SUBSTITUTED PHENYL-AZO-PHENYLENE-AZO-PHENYL DYES

Ruedi Altermatt, Buckten, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

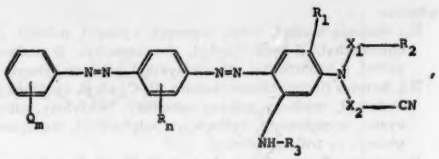
Filed June 12, 1972, Ser. No. 262,066

Claims priority, application Switzerland, June 17, 1971, 8819/71

Int. Cl.² C07C *31/04, 31/08, 31/14, 43/18*

U.S. Cl. 260—187 25 Claims

1. A compound of the formula



wherein each Q is independently halo, hydroxy, nitro, cyano, thiocyano, methylsulfonyl, alkyl, alkoxy, alkylcarbonyl or alkoxycarbonyl,

each R is independently halo, hydroxy, nitro, cyano, thiocyano, methylsulfonyl, alkyl, alkoxy, alkylcarbonyl or alkoxycarbonyl,

R_1 is hydrogen, alkyl or alkoxy,

R_2 is alkylcarbonyloxy, alkylcarbonyloxy monosubstituted by halo, cyano, acetyl, alkoxy, phenyl or phenoxy, alkoxycarbonyloxy, alkoxycarbonyloxy monosubstituted by halo or phenyl, benzoyloxy or benzoyloxy monosubstituted by halo, alkyl or nitro,

R_3 is formyl, alkylcarbonyl, alkylcarbonyl monosubstituted by halo, cyano, acetyl, alkoxy or phenyl, dihaloalkylcarbonyl, alkoxycarbonyl, alkoxycarbonyl monosubstituted by halo or phenyl, benzoyl or phenoxycarbonyl,

each of X_1 and X_2 is independently straight or branched chain alkylene of 1 to 6 carbon atoms,

m is 0, 1 or 2, and *n* is 0, 1 or 2,

wherein each halo is independently chloro or bromo, and

each alkyl, alkoxy, alkyl chain of alkylcarbonyl, dihaloalkylcarbonyl and alkylcarbonyloxy and alkoxy chain of alkoxycarbonyl and alkoxycarbonyloxy independently has 1 to 6 carbon atoms.

3,956,269

AZO FREE RADICAL INITIATORS CONTAINING ULTRAVIOLET LIGHT STABILIZING GROUPS

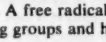
Chester S. Sheppard, and Ronald E. MacLeay, both of Buffalo, N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Continuation of Ser. No. 98,893, Dec. 16, 1970, abandoned. This application Jan. 22, 1974, Ser. No. 435,623

Int. Cl.² C07C *107/02*

U.S. Cl. 260—192 5 Claims

1. A free radical initiator containing ultraviolet light stabilizing groups and having the formula:

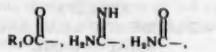


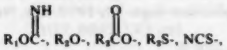
wherein

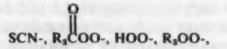
R′ is selected from the group consisting of alkyl of 1-20 carbons cycloalkyl of 3–10 carbons, aralkyl of 7–20 carbons and

wherein

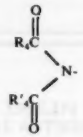
Y is selected from the group consisting of NC—, N_3—,







and



wherein

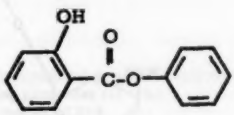
R_1 and R_2 are selected from the group consisting of alkyl of 1–20 carbons, cycloalkyl of 3–6 carbons, and alkylene of 2–30 carbons when R_1 and R_2 are joined together; and wherein one but not both of R_1 and R_2 may in addition be phenyl, tolyl, xylyl, benzyl, or phenethyl;

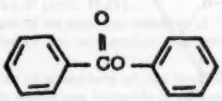
R_3 is t-alkyl of 4–8 carbons, t-cycloalkyl of 4-8 carbons or t-aralkyl of 9–15 carbons;

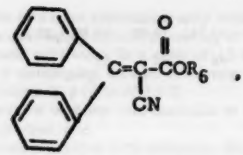
R_4 and R'_4 are alkyl of 1–6 carbons, cycloalkyl of 3–6 carbons or aryl of 6–12 carbons

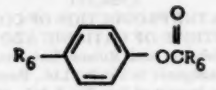
R is any of the foregoing radicals for R′, and in addition, may be selected from the group consisting of aryl of 6–14 carbons, acyl of 2–20 carbons, aroyl of 7–20 carbons, carbamoyl, alkylcarbamoyl of 2–7 carbons, cycloalkylcarbamoyl of 4–11 carbons, $-CO_2Na$, $-CO_2K$, alkoxycarbonyl of 2–7 carbons, cycloalkoxycarbonyl of 4–11 carbons, and aryloxycarbonyl of 7–13 carbons, with the proviso that when R is carbamoyl, R′ can be, in addition, alkoxycarbonyl of 2–7 carbons, cycloalkoxycarbonyl of 4–11 carbons, or aryloxycarbonyl of 4–11 carbons and

at least one of R and R′ contains an ultraviolet light stabilizing radical of a compound selected from the group consisting of

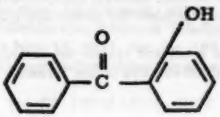








and



where R_4 is alkyl of 1–6 carbons.

3,956,270

β-MODIFIED AZO DYE

Leonhard von Rambach; Ewald Daubach, and Bertold Honigmann, all of Ludwigshafen, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

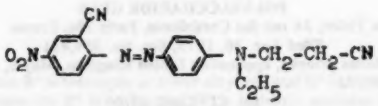
Filed Oct. 4, 1973, Ser. No. 403,640

Claims priority, application Germany, Oct. 11, 1972, 2249739

Int. Cl.² C09B *46/00*

U.S. Cl. 260—205 **1 Claim**

1. The dye of the formula:



which has the X-ray diffraction graph which exhibits the following principal lines:

angle 2 H	10.99	11.72	14.00	14.79	25.35	26.25	26.50
in-tensity in %::	44	98	60	35	42	100	43.

3,956,271

PROCESS FOR THE PRODUCTION OF CONCENTRATED SOLUTIONS OF CATIONIC AZO DYES

Ulrich Blass, Reinach, and Roland Entschel, Basel, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 2,347, Jan. 12, 1970, abandoned, and a continuation-in-part of Ser. No. 2,348, Jan. 12, 1970, abandoned. This application Feb. 6, 1974, Ser. No. 439,913

Claims priority, application Switzerland, Jan. 20, 1969, 735/69; Apr. 8, 1969, 5257/69; July 30, 1969, 11592/69

Int. Cl.² C09B *43/00*

U.S. Cl. 260—208 25 Claims

1. A process for the production of a concentrated liquid dye preparation of a cationic azo dye, said concentrated liquid dye preparation being suitable for direct application to textiles, comprising

a. reacting in a solvent system an insoluble or sparingly soluble cationic azo dye of the formula

$$F^+ A_1^-$$

with a non-chromophoric carboxylate salt of the formula

$$M^+ A^-$$

to obtain a concentrated solution of a soluble cationic azo dye of the formula

$$F^+ A^-$$

wherein

F^+ is the cation of an insoluble or sparingly soluble cationic azo dye,

A_1^- is the anion of an insoluble or sparingly soluble cationic azo dye,

M^+ is a non-chromophoric cation, and

A^- is a non-chromophoric carboxylate anion,

with the provisos that

1. the reactants and solvent system are chosen such that $F^+ A^-$ is more soluble in the solvent system than is $F^+ A_1^-$,
2. $F^+ A^-$ is soluble enough to form a concentrated solution in the solvent system,
3. $M^+ A^-$ and $F^+ A_1^-$ are present in amounts sufficient for the preparation of a concentrated solution, and
4. $M^+ A^-$ is soluble or partially soluble in the solvent system, and

b. removing any precipitated salts, whereby a concentrated liquid dye preparation is obtained.

3,956,272

POLYSACCHARIDE GELS

Rene Tixier, 24 rue des Cordelieres, Paris 13e, France

Filed Apr. 30, 1973, Ser. No. 355,481

Claims priority, application United Kingdom, May 1, 1972, 20091/72

Int. Cl.² C08B *37/00*

U.S. Cl. 260—209 R 4 Claims

1. A strengthened polysaccharide gel obtained by reacting a polysaccharide gel selected from the group consisting of gelose and agarose, with 2,4,6-trichloro-1,3,5-triazine.

3,956,273

MODIFIED AGAROSE AND AGAR AND METHOD OF MAKING SAME

Kenneth B. Guiseley, Union, Maine, assignor to Marine Colloids, Inc., Rockland, Maine

Continuation of Ser. No. 150,778, June 7, 1971, abandoned. This application Sept. 20, 1973, Ser. No. 398,955

Int. Cl.² C08B *37/12*

U.S. Cl. 260—209 R 6 Claims

1. A modified agarose containing additional groups substituted therein selected from the group consisting of alkyl and alkenyl groups each containing from 1 to 3 carbon atoms and hydroxyalkyl groups each containing from 1 to 4 carbon atoms, the increased degree of substitution above the corresponding unmodified agarose being from about 0.01 to about 1.0, said modified agarose being water-soluble and having a gelling temperature at least 1°C. lower than the gelling temperature of the corresponding unmodified agarose.

3,956,274

NEW COMPOUND 6'-DEOXY-'-SUBSTITUTED OR UNSUBSTITUTED AMINO-LIVIDOMYCINS AND THE PRODUCTION THEREOF

Sumio Umezawa; Hamao Umezawa, both of Tokyo; Osamu Tsuchiya, Yokohama, and Isamu Watanabe, Murayama, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

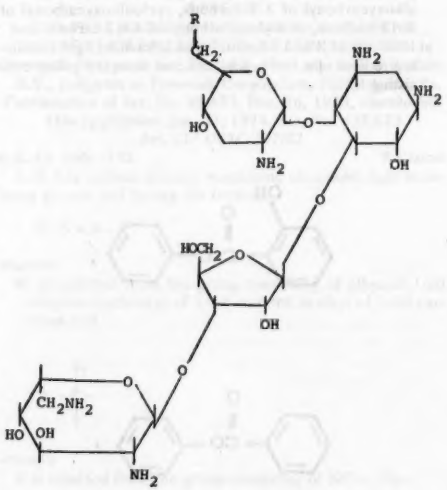
Filed Mar. 5, 1974, Ser. No. 448,250

Claims priority, application Japan, Mar. 13, 1973, 48-28513

Int. Cl.² C07H *15/22*

U.S. Cl. 260—210 AB 9 Claims

1. A 6'deoxy-6'-amino-lividomycin B compound of the formula:



wherein R is amino, monoalkylamino of 1–4 carbon atoms or 2-hydroxyethylamino, or a pharmaceutically acceptable acid addition salt thereof.

3,956,275

2-DEOXYSTREPTOMYCIN

Arnold L. Demain, Wellesley, Mass., and Kozo Nagaoka, Yokohama, Japan, assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jan. 20, 1975, Ser. No. 542,645
Int. Cl.² C07H *15/22*
U.S. Cl. 260—210 S 1 Claim

1. 2-Deoxystreptomycin.

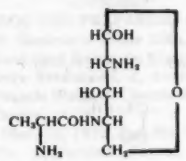
3,956,276

NOVEL ANTIFUGAL ANTIBIOTIC SUBSTANCE, PROCESS FOR PRODUCTION OF THE SAME, AND AGRICULTURAL AND HORTICULTURAL FUNGICIDAL COMPOSITION CONTAINING SAID SUBSTANCE

Toju Hata; Satoshi Omura; Michiko Katagiri, all of Tokyo; Juichi Awaya, Soka; Shimpei Kuyama, Tokyo; Shizuo Higashikawa, Kunitachi; Kazuomi Yasui, Hino, and Haruko Terada, Hino, all of Japan, assignors to Nihon Tokushu Moyaku Seizo Kabushiki Kaisha and The Kiyasato Institute, both of Tokyo, Japan

Filed July 17, 1972, Ser. No. 272,217
Claims priority, application Japan, June 29, 1971, 46–47411
Int. Cl.² C07H *5/00*
U.S. Cl. 260—211 R 2 Claims

1. The antifungal antibiotic substance "F-1028" having the following formula,



or an hydrochloric acid salt or sulfuric acid salt thereof, which has the following properties (i) –(ix):

i. molecular weight of 219,
ii. colorless crystal
iii. melting point of the hydrochloric acid salt thereof is above 195°C (decomposition),
iv. specific rotation of the hydrochloric acid salt thereof is $[\alpha]_D$ 23 = 63.2° (c=1, H_2O),
v. UV spectrum of an aqueous solution of the hydrochloric acid salt thereof has no peculiar absorption as shown in FIG. 1,
vi. IR spectrum of a mixture of the hydrochloric acid salt thereof with potassium bromide is as shown in FIG. 2,
vii. Rf value in thin-layer chromatography with silica gel is 0.68 with a developing solvent consisting of n-propanol-pyridine-acetic acid-water in a ratio of 15:10:3:12; and 0.21 with a developing solvent consisting of butanol-acetic acid-water in a ratio of 3:1:2,
viii. readily soluble in water and insoluble in chloroform, benzene and ether, and
ix. color reaction is positive with ninhydrin, Ehrlich, Elson-Morgan, Tollens and Benedict reagents, and negative with Molisch, Sakaguchi, maltol and ferric chloride reagents.

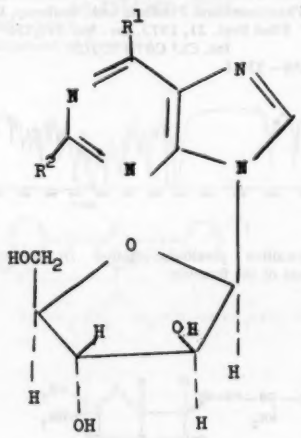
3,956,277

PURINE SUGAR DERIVATIVES

Gertrude B. Elion, Chapel Hill; Janet E. Litster, Raleigh, and Lowrie M. Beacham, III, Durham, all of N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Nov. 15, 1971, Ser. No. 198,991
Claims priority, application United Kingdom, Nov. 16, 1970, 54504/70
Int. Cl.² C07H *19/16*, *19/18*
U.S. Cl. 260—211.5 R 5 Claims

1. A compound of formula (I) or a pharmaceutically aceptable salt thereof



(I)

wherein R^1 is mercapto or lower alkylthio and R^2 is amino or hydrogen, or R^1 is amino and R^2 is hydroxy, provided that whenever R^1 is mercapto or methylthio, R^2 is amino, said compound having a β-configuration regarding the linkage between the purine and D-arabinofuranosyl moiety.

3,956,278
NOVEL MIXED PARTIAL ESTERS OF CARBOHYDRATES

Vinzenz Prey, Vienna, Austria, assignor to Krems-Chemie Gesellschaft m.b.H., Krems, Austria

Filed Nov. 5, 1973, Ser. No. 412,831
Int. Cl.² C08B 37/00
U.S. Cl. 260—234 R 17 Claims

1. A process for the preparation of a mixed partial ester of a carbohydrate selected from the group consisting of monosaccharides, oligosaccharides and acid hydrolysis products of oligosaccharides and polysaccharides, said ester containing up to one acyl group per monose unit of aliphatic acyl groups having up to two carbon atoms in the chain and up to 75% of fatty acid moiety having at least six carbon atoms in the chain, which consists essentially of:

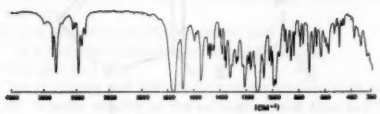
a. reacting said carbohydrate with an aliphatic acylation agent having up to two carbon atoms in the chain until the resulting product has an acylation number of a maximum of one acyl group per monose unit, and

b. reacting the reaction mixture from (*a*) with a higher fatty acid reactant selected from the group consisting of fatty acids having at least six carbon atoms in the chain, anhydrides of such fatty acids and mixtures thereof, in the presence of an acid catalyst selected from the group consisting of proton acids, Lewis acids and acid ion-exchangers in the H-form.

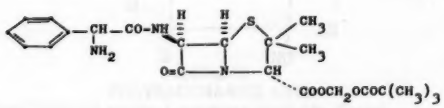
3,956,279
CRYSTALLINE PIVALOYLOXYMETHYL D(-)-α-AMINOBENZYLPENICILLINATE

Ernst Torndal Binderup, Tastrup; Hans Jorgen Petersen, Herlev, and Sven Liisberg, Vedbaek, all of Denmark, assignors to Leo Pharmaceutical Products Ltd., Ballerup, Denmark

Filed Sept. 21, 1973, Ser. No. 399,736
Int. Cl.² C07D 501/20
U.S. Cl. 260—239.1 1 Claim



1. Crystalline pivaloyloxymethyl D(-)-α-aminobenzylpenicillinate of the formula:



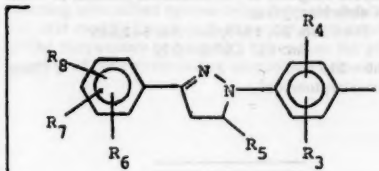
and having the following characterizing data: Infra-red spectrum (KBr, 0,5%) having strong absorption bands at: 3360, 3310, 1765–1745, 1680 cm^{-1} as will appear from FIG. 1 attached hereto and a melting point of 115°–117°C.

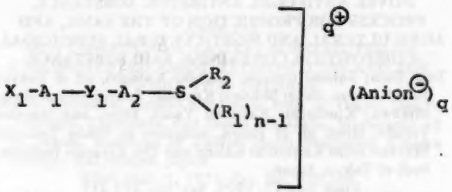
3,956,280
PYRAZOLINE COMPOUNDS

Fritz Fleck, Rottmingen, Switzerland; Peter Stuart Littlewood, Ilkley, and Alec Victor Mercer, Leeds, both of England, assignors to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 272,422, July 17, 1972, abandoned. This application Dec. 20, 1974, Ser. No. 534,799
Claims priority, application Switzerland, July 19, 1971, 10577/71; Oct. 13, 1971, 14977/71; Oct. 25, 1971, 15546/71
Int. Cl.² C07D 231/06
U.S. Cl. 260—239.65 17 Claims

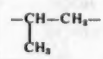
1. A compound of the formula





where X_1 is $—SO_2—$, —CO—O or $—SO_2—NH—$,
Y_1 is —O—, —CO—O or

A_1 and A_2 are each $—CH_2—CH_2—$or



R_1 is alkyl of 1 to 5 carbon atoms which may be monosubstituted by chlorine, hydroxyl, cyano, or aminocarbonyl; or phenyl,

R_2 is one of the groups specified for R_1 or together with R_9 forms an ethylene group,

R_3 and R_4 each is hydrogen, chlorine, methyl or methoxy,

R_5 is hydrogen, methyl or phenyl,

either two of R_6, R_7 and R_8 are hydrogen and the other is hydrogen, chlorine, alkyl or alkoxy of 1 to 5 carbon atoms, cyano, phenyl, or alkanoylamino or alkoxycarbonylamino of 2 to 5 carbon atoms,

or one of R_6, R_7 and R_8 is hydrogen and the others are chlorine,

R_9 is hydrogen or unsubstituted alkyl of 1 to 5 carbon atoms,

n is the integer 1 or 2,

q is the number of radicals R_1 present, and Anion⁻ signifies an equivalent of a colorless anion.

3,956,281
PREPARATION OF SUBSTITUTED ALDAZINES

Lionel Katzoff, Baltimore, and Achille Silvestri, Bel Air, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 7, 1969, Ser. No. 851,142
Int. Cl.² C07D *295/00*; C07C *131/00*
U.S. Cl. 260—240 G **2 Claims**

1. A method of preparing 2-diphenylacetyl-1, 3-indandione-1-p-dimethylaminocinnamaldazine comprising the steps of preparing a mixture by mixing 1.75 grams of p-dimethylaminocinnamaldehyde with 2.92 grams of 2-diphenylacetyl-1, 3-indandione-1-hydrazone; stirring the mixture to produce a homogeneous mixture; adding 50 ml of chloroform and approximately 2 drops of concentrated HCl to the homogeneous mixture to form a solution, said HCl being adapted to act as a catalyst; refluxing the chloroform-homogeneous mixture solution for approximately 20 minutes, filtering the refluxed solution while hot to remove any unreacted starting materials; cooling the filtered solution to room temperature; adding 100 to 200 ml of anhydrous ether to the cooled solution to produce a red precipitate; filtering the cooled solution to separate the precipitate; and recrystallizing the precipitate from 50 ml of a boiling methanol-chloroform mixture to produce a product having a melting point of 198°C, said methanol-chloroform mixture being in the ratio of 10:1 **respectively.**

2. A method of preparing 2-diphenylacetyl-1, 3-indandione-1-p-N-methiodidepyridine carboxaldazine comprising the steps of preparing a mixture by mixing 2.50 grams of N-methiodide-4-pyridine carboxaldehyde with 2.92 grams of 2-diphenylacetyl-1, 3-indandione-1-hydrazone; stirring the mixture to produce a homogeneous mixture; adding 50 ml of chloroform and approximately two drops concentrated HCl to the homogeneous mixture to form a solution, said HCl being adapted to act as a catalyst; refluxing the chloroform-homogeneous mixture solution for approximately thirty minutes; cooling the refluxed solution to room temperature; adding 100 to 200 ml of anhydrous ether to the cooled refluxed solution to produce a brownish orange precipitate; adding 50 ml of a hot methanol-chloroform mixture to the ether-cooled refluxed solution to extract the precipitate, said methanol-chloroform mixture being in the ratio of 10:1 respectively; filtering the methanol-chloroform-ether refluxed solution while hot to produce a product having a melting point of 230°C.

3,956,282
METHOD FOR PREPARING AZINES

Pierre Tellier, 35, Boulevard Emile Zola, 69 Oullins; Henri Mathais, 31, Boulevard Baron du Marais, 69, Ste.-Foy-les-Lyon; Jean-Pierre Schirmann, 4, Avenue de la Gare, 69 Brignais, and Francis Weiss, 3, Chemin du Perron, 69 Pierre Benite, all of France

Filed Mar. 13, 1973, Ser. No. 340,763
Claims priority, application France, Mar. 16, 1972, 72.09134
Int. Cl.² C07C *119/00*
U.S. Cl. 260—240 G **4 Claims**

1. A method for preparing azines which consists of reacting

a. ammonia;

b. a carbonyl compound selected from formaldehyde, acetaldehyde, propionaldehyde, butyraldehyde, isobutyraldehyde, n-pentanal, pivalaldehyde, oenanthal, 2-ethylhexanal, 3-Δ-tetrahydrobenzaldehyde, hexahydrobenzaldehyde, 5-norbornene-2-carboxaldehyde, tetrahydropyran-2-carboxaldehyde, benzaldehyde, a monochlorobenzaldehyde, p-nitrobenzaldehyde, β-chloropropionaldehyde, β-methoxypropionaldehyde, 4-cyano-2,2-dimethylbutyraldehyde, acetone, 2-butanone, 2-pentanone, 3-pentanone, methylisopropylketone, methylisobutylketone, ethylamylketone, methylcyclohexylketone, acetophenone, benzophenone, cyclobutanone, cyclopentanone, cyclohexanone, a methylcyclohexanone, 2,4-dimethylcyclohexanone, 3,3,5-trimethylcyclohexanone, cycloheptanone, cyclooctanone, cyclodecanone and cyclododecanone, and mixtures thereof;

c. hydrogen peroxide; and

d. a carboxylic ester selected from β-propiolactone, γ-butyrolactone, σ-valerolactone, ε-caprolactone and the formates, acetates, monochloroacetates, trichloroacetates, trifluoroacetates, propionates, butyrates, isobutyrates, valerates, hexanoates, octanoates, nonanoates, dodecanoates, benzoates, chlorobenzoates, p-methoxybenzoates, p-nitrobenzoates, oxalates, malonates, succinates, glutarates, adipates, pimelates, butane-1,2,4-tricarboxylates, o-phthalates, isophthalates, terephthalates, trimellitates, pyromellitates, β-hydroxypropionates, tartrates and citrates of methanol, ethanol, n-propanol, isopropanol, n-butanol, isobutanol, 2-butanol, tertiary butanol, an amyl alcohol, n-hexanol, n-heptanol, n-octanol, 2-ethylhexanol, n-dodecanol, cyclohexanol, a methcyclohexanol, allylic alcohol, crotylic alcohol, Δ-3-tetrahydrobenzylic alcohol, benzylic alcohol, 2-methoxyethanol, 3-methoxy propanol, 2-ethoxyethanol, 3-ethoxyisopropanol, ethylene glycol, propylene glycol, 1,3-propanediol, 1-buten-3,4-diol, 2-buten-1,4-diol, 2-methylenyl-1,3-propanediol, glycerol, 1,2,3,4-butane tetrol, 1,1,1-trimethylol ethane, 1,1,1-trimethylol propane, pentaerythritol, sorbitol, Δ-3-1,1-dimethyol cyclohexane, phenol, mono and dichlorophenols, a mononitrophenol, a monoethoxyphenol, a cresol, pyrocatechol, resorcinol and hydroquinone,

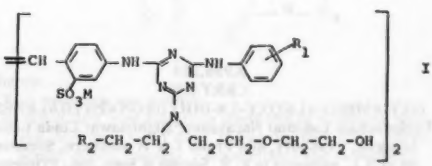
and recovering the azine or mixture of azines from the reaction medium.

3,956,283
BIS-(TRIAZINYLAMINO)-STILLENE DERIVATIVES

Fritz Fleck, Bottmingen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed May 16, 1974, Ser. No. 470,523
Int. Cl.² C07D *403/10*
U.S. Cl. 260—240 B **39 Claims**

1. A compound of formula I,



I

in which R_1 is hydrogen, fluorine, bromine, chlorine, C_{1-6}alkyl, C_{1-6}alkoxy or $-SO_3M$,

R_2 is cyano or $-CONR_3R_4$,

in which either R_3 and R_4, independently, each is hydrogen, C_{1-6} alkyl or C_{2-6} hydroxyalkyl,

or R_3 and R_4, together with the nitrogen atom to which they are attached, form pyrrolidino, piperidino or morpholino, and

M is hydrogen or a non-chromophoric cation.

3,956,284

HETEROCYCLIC 15-SUBSTITUTED-ω-PENTANORPROSTOGLANDINS

Hans-Jurgen E. Hess, Old Lyme; Michael R. Johnson, Gales Ferry; Jasjit S. Bindra, Groton, and Thomas K. Schaaf, Old Lyme, all of Conn., assignors to Pfizer Inc., New York, N.Y.

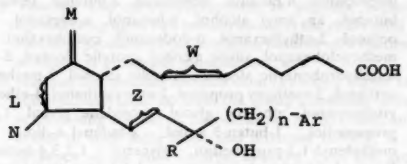
Continuation-in-part of Ser. Nos. 271,220, July 13, 1972, abandoned, and Ser. No. 425,517, Dec. 17, 1973, abandoned. This application July 3, 1974, Ser. No. 485,596

Claims priority, application New Zealand, July 4, 1973, 171269

Int. Cl.² C07D 307/12, 333/16

U.S. Cl. 260—240 R 14 Claims

1. A compound of the structure:



wherein

Ar is α- or β-furyl or α- or β-thienyl;

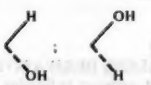
R is hydrogen or lower alkyl;

n is an integer from 1 to 5;

W and L are each a single bond or cis double bond;

Z is a trans double bond;

M is keto,



N is hydrogen or α-hydroxyl;

and wherein L, M and N are so selected as to complete the structure of a prostaglandin of the A, E or F series.

3,956,285

CERTAIN OXY-AMINO-ALKOXY-5,8-DIHYDRONAPHTHALENES

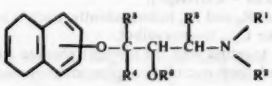
Venkatachala Lakshmi Narayanan, Hightstown; Linda Louise Setescak, Cranbury, and Frank Lee Weisenborn, Somerset, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 5,993, Jan. 26, 1970, Pat. No. 3,668,206, which is a division of Ser. No. 768,176, Oct. 16, 1968, Pat. No. 3,534,085. This application Mar. 6, 1972, Ser. No. 232,286

Int. Cl.² C07D 295/08

U.S. Cl. 260—243 B 6 Claims

1. A compound of the formula



wherein the radical

is pyrrolidino, morpholino, thiamorpholino, or said radicals substituted by one or two C_1-C_4 alkyl groups or one C_1-C_4 alkoxy group, R^3, R^4 and R^5 each is hydrogen or C_1-C_4 alkyl and R^6 is hydrogen, C_2-C_{12} alkanoyl, phenacetyl or benzoyl, and physiologically acceptable acid addition salts of said compounds.

3,956,286

PROCESS FOR PRODUCING 7-ACYLAMIDO-7-ALKOXYCEPHALOSPORINS

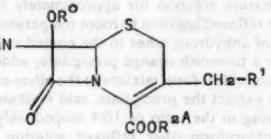
William H. W. Lunn, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Oct. 16, 1972, Ser. No. 298,165

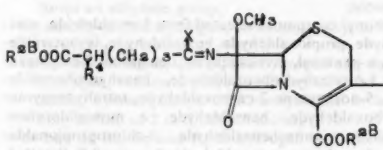
Int. Cl.² C07D 501/04, 501/18

U.S. Cl. 260—243 C 7 Claims

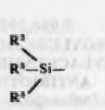
1. The process for preparing a compound of the formula:



wherein R^9 represents primary loweralkyl of C_1–C_4 or methyl-d_3; R^1 represents acetoxy, carbamoyloxy, α-methoxy-p-hydroxycinnamoyloxy, propionyloxy, benzoyloxy, methoxy, methylthio, 1-methyl-1,2,3,4-tetrazol-5-ylthio, or 5-methyl-1,3,4-thiadiazol-2-ylthio; R^{2A} represents hydrogen or R^2; and R^2 represents alkyl of C_1–C_6, 2,2,2-trichloroethyl, 2-iodoethyl, tert-alkenyl of C_5–C_7, tert-alkynyl of C_5–C_7, benzyl, ar-nitrobenzyl, tetrahydropyranyl, succinimidomethyl, phthalimidomethyl, ar-methoxybenzyl, ar, ar-dimethoxybenzyl, cyanomethyl, nitrophenyl, dinitrophenyl, 2,4,6-trinitrophenyl, bis(p-methoxyphenyl)methyl, triphenylmethyl, diphenylmethyl, benzyloxymethyl, loweralkanoyloxymethyl of C_3–C_6, or phenacyl; which process comprises reacting an imino halide compound of the formula:



wherein X represents bromide or chloride; R^1 is as defined above; R^{2B} represents R^2 as defined above, loweralkanoyl of C_3–C_4 or radical of the formula:



wherein each R^3 independently represents loweralkyl of C_1–C_4 or halo selected from the group consisting of bromo, chloro, fluoro, and iodo subject to the limitation that at least one R^3 represents loweralkyl as defined; and R^4 represents an acylamido group wherein the acyl is

alkanoyl of C_1–C_4,
benzoyl,
naphthoyl,
alkoxycarbonyl of C_2–C_5,
cycloalkoxycarbonyl of C_6–C_7,
benzyloxycarbonyl,
naphthyloxycarbonyl,
one of the above groups substituted with from one to three groups, each selected from the group consisting of halo, nitro, loweralkoxy of C_1–C_4, cyano, and in the instance of benzoyl, naphthoyl, benzyloxy, and naphthyloxy, by loweralkyl of C_1–C_4, or
phthaloyl;

with an alcohol of the formula R^6—OH under essentially non-aqueous conditions.

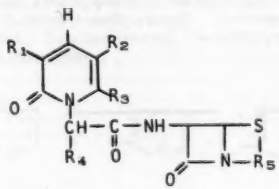
3,956,287

7-[(2-OXO-1-PYRIDINYL)ACYLAMINO]CEPHALOSPORIN DERIVATIVES

Ronald E. Bambury; Michael L. Edwards, both of Cincinnati, and Laird F. Miller, Loveland, all of Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Filed Nov. 7, 1973, Ser. No. 413,566
Int. Cl.² C07D *501/20, 499/44*
U.S. Cl. 260—243 C **5 Claims**

1. A compound having the formula:

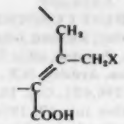


in which either R_1 or R_2 is selected from the group consisting of hydrogen, halogen, hydroxyl, lower alkyl, trifluoromethyl, nitro, amino, cyano, carboxy, carbomethoxy and carbethoxy;

R_3 is selected from the group consisting of hydrogen, halogen, hydroxyl, lower alkyl, trifluoromethyl, nitro, amino, cyano, carboxy, carbomethoxy, carbethoxy, and which when taken in combination with R_2 forms the cyclic radical $—CH_2CH_2CH_2CH_2—$ and $—CH=CH—CH=CH—$;

R_4 is selected from the group consisting of hydrogen, methyl, carboxy, carbomethoxy and carbethoxy;

R_5 is



wherein X is hydrogen, hydroxy, acetoxy, N-pyridinium 5-methyl-1,3,4-thiadiazol-2-ylthio and 1-methyl-1,2,3,4-tetrazol-5-ylthio; and the pharmaceutically acceptable salts thereof.

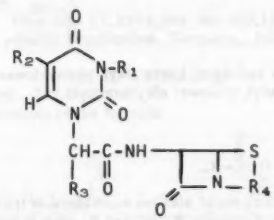
3,956,288

7-[(2,4-DIOXO-1-PYRIMIDINYL)ACYLAMINO]CEPHALOSPORIN DERIVATIVES

Ronald E. Bambury; Michael L. Edwards, both of Cincinnati, and Laird F. Miller, Loveland, all of Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Filed Nov. 7, 1973, Ser. No. 413,564
Int. Cl.² C07D *501/20, 499/44*
U.S. Cl. 260—243 C **6 Claims**

1. A compound having the formula



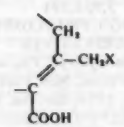
wherein

R_1 is hydrogen and methyl;

R_2 is selected from the group consisting of hydrogen, halogen, hydroxyl, lower alkyl, trifluoromethyl, nitro, amino, acetyl, cyano, carboxy, carbomethoxy and carbethoxy;

R_3 is selected from the group consisting of hydrogen, methyl, phenyl, carboxy, carbomethoxy and carbethoxy:

R_4 is



wherein X is hydrogen, hydroxy, acetoxy, N-pyridinium, 5-methyl-1,3,4-thiadiazol-2-ylthio and 1-methyl-1,2,3,4-tetrazol-5-ylthio; and the pharmaceutically acceptable salts thereof.

3,956,289

ANTIOXIDANT COMPOSITION

Brian McGuigan, Timperley; Richard John Dellar, Bolton, and William David Phillips, Poynton, all of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 296,451, Oct. 10, 1972, Pat. No. 3,909,448. This application July 17, 1974, Ser. No. 489,336
Claims priority, application United Kingdom, Oct. 16, 1971, 48208/71
The portion of the term of this patent subsequent to May 6, 1992, has been disclaimed.
Int. Cl.² C07D 279/22
U.S. Cl. 260—243 A 3 Claims

1. 1-(3',7'-di-t-octyl-10'-phenothiazinyl)3,7-di-t-octyl-phenothiazine.

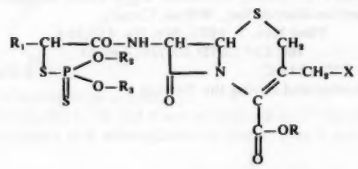
3,956,290

[(THIOPHOSPHONOTHIO)ACETAMIDO]CEPHALOSPORIN DERIVATIVES

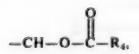
Uwe D. Treuner, and Hermann Breuer, both of Regensburg, Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 258,687, June 1, 1972, Pat. No. 3,914,221. This application Jan. 20, 1975, Ser. No. 542,329
Int. Cl.² C07D 501/28
U.S. Cl. 260—243 C 8 Claims

1. A compound of the formula



wherein R is hydrogen, lower alkyl, phenyl-lower alkyl, tri(-lower alkyl)silyl, tri(lower alkyl)stannyl,



aluminum, alkali metal, alkaline earth metal or tri(lower alkyl-)amine; R_1 is hydrogen; R_2, R_3 and R_4 each is lower alkyl or phenyl-lower alkyl; and X is hydrogen, hydroxy or lower alkanoyloxy, said lower alkyl and lower alkanoyloxy groups having up to eight carbon atoms.

3,956,291

THIOACETAMIDO CEPHALOSPORANIC ACID DERIVATIVES

Abraham Nudelman, Bala Cynwyd, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Nov. 8, 1974, Ser. No. 522,362
Int. Cl.² C07D 501/28
U.S. Cl. 260—243 C 1 Claim

1. A compound which is 7-[2-[(cyanomethylthio)-(methylsulfonylimino)methylthio]acetamido]cephalosporanic acid or an alkali metal, alkaline earth metal or ammonium salt thereof.

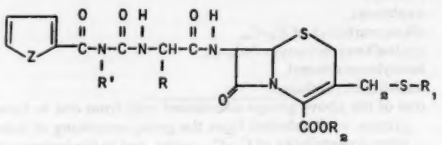
3,956,292

7-(α-FUROYLUREIDOARYL AND CYCLOHEXADIENYLACETAMIDO) CEPHALOSPORIN ANTIBIOTICS

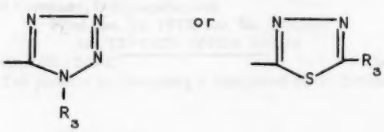
Robin D. G. Cooper, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 456,491, April 1, 1974, abandoned. This application Mar. 3, 1975, Ser. No. 553,061
Int. Cl.² C07D 501/24
U.S. Cl. 260—243 C 16 Claims

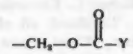
1. The compound of the formula



wherein Z is O or S;
R' is hydrogen or methyl;
R is phenyl, methylphenyl, mono- or dihydroxyphenyl, mono- or dihalophenyl, monohydroxy substituted mono or dihalophenyl, thienyl, furyl, or 1,4-cyclohexadienyl;
R_1 is



wherein R_3 is C_1-C_4 alkyl;
R_2 is hydrogen, indanyl, phthalidyl, or an acyloxymethyl group of the formula



wherein Y is C_1-C_4 alkyl or phenyl;
and when R_2 is hydrogen, the pharmaceutically acceptable nontoxic salts thereof.

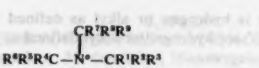
3,956,293

TRI (FLUROALIPHATIC) α FLUOSULFATO AMINES AND DERIVATIVES THEREOF

Frank J. Pavlik, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 703,867, Feb. 8, 1968, abandoned. This application Mar. 12, 1971, Ser. No. 123,837
Int. Cl.² C07D 265/32
U.S. Cl. 260—246 B 11 Claims

1. The compound represented by the formula:



wherein R^1 through R^9 are alpha-carbon substituents selected from the class consisting of fluorine, fluoroaliphatic having no more than 20 carbon atoms in the skeletal chain, and fluosulfato (—OSO_2F), with the proviso that at least one of R^1 through R^9 is fluoroaliphatic and at least one is fluosulfato, and with the further proviso that any pair of alpha-carbon substituents, one member of the pair from one alpha carbon and one from another, can form a pyrrolidino, piperidino, hexamethyleneimino, or morpholino ring.

3,956,294

SUBSTITUTED PYRIDINE COMPOUNDS

Erwin Eleckenstein, Hofheim, Taunus; Ernst Heinrich, Frankfurt am Main-Fechenheim, and Reinhard Mohr, Offenbach-Rumpenheim, all of Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Germany

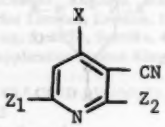
Division of Ser. No. 372,024, June 21, 1973. This application Nov. 6, 1974, Ser. No. 521,443

Claims priority, application Germany, June 22, 1972, 2230392

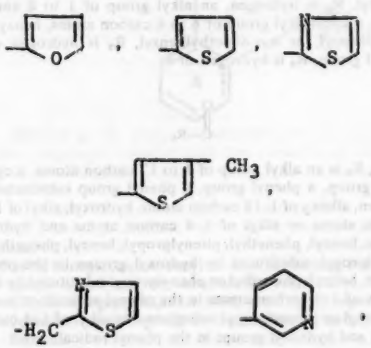
Int. Cl.[2] C07D *295/12*

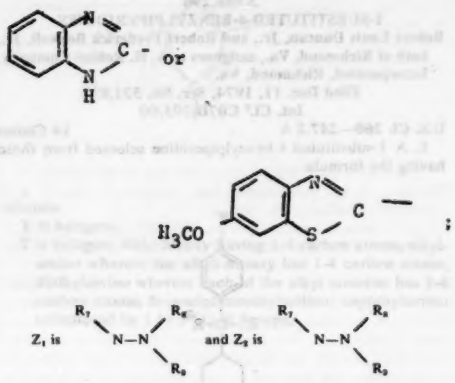
U.S. Cl. 260—246 B **10 Claims**

1. A compound of the formula



wherein X is alkyl having 1 to 6 carbon atoms, alkenyl having 2 to 6 carbon atoms, cycloalkyl having 3 to 8 carbon atoms, phenyl, benzyl, phenethyl, hydrogen, 2-dimethylaminoethyl, 2-diethylaminoethyl, 2-morpholinoethyl, 2-piperidinoethyl, 2-pyrrolidinoethyl, N-methyl-N'-piperazinoethyl, 2-cyanoethyl, 2-hydroxyethyl, 2-methoxyethyl, 2-acetoxyethyl, 2-phenoxyacetoxyethyl, N-ethylcarbamoyloxyethyl, N-phenylcarbamoyloxyethyl, 2-phenoxyethyl, 3-methoxypropyl, 3-methylbenzyl, 2-methylphenyl, 4-methylphenyl, 2,4-dimethylphenyl, 2-chloro-4-methylphenyl, 2-chlorophenyl, 4-chlorophenyl, 2-methoxyphenyl, 4-methoxyphenyl, 2,5-dimethyl-4-chlorophenyl.





wherein R_7 is hydrogen, alkyl having 1 to 6 carbon atoms or phenyl and R_8 and R_9 taken separately are alkyl having 1 to 6 carbon atoms or phenyl and taken together with the nitrogen atom to which they are attached form a morpholino, pyrrolidino, piperidino or piperazino radical.

3,956,295

CARBAZOLE DERIVATIVES

Helmut Biere; Hanns Ahrens; Clemens Rufer; Eberhard Schroder, and Henning Koch, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

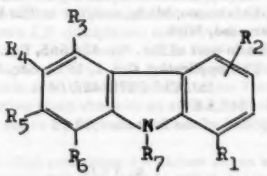
Filed July 17, 1974, Ser. No. 489,162

Claims priority, application Germany, July 18, 1973, 2337154

Int. Cl.[2] C07D *209/82*

U.S. Cl. 260—247.5 FP **49 Claims**

1. A carbazole of the formula



wherein R_1 is a hydroxymethyl group, alkanoyloxymethyl of 1–8 carbon atoms in the alkanoyl group, tetrazolyl, cyano, oximinocarbonyl, aminocarbonyl, alkoxycarbonyl, dialkylaminoalkoxycarbonyl, dialkylaminocarbonyl, wherein alkoxy is of 1–8 carbon atoms and alkyl is of 1–4 carbon atoms, N-morpholinocarbonyl, or carboxy or a salt thereof with a physiologically acceptable base,

1 or 2 of R_2 through R_6 is a halogen atom, and the remainder are hydrogen atoms, alkyl of 1–4 carbon atoms, trifluoromethyl, or alkoxy of 1–4 carbon atoms, or

R_3 and R_4 collectively with the carbon atoms to which they are attached also are a cyclopentene, cyclohexene or benzene ring, and

R_7 is a hydrocarbon of 3–8 carbon atoms, or a hydrogen atom.

3,956,296

1-SUBSTITUTED-4-BENZYLPIPERIDINES

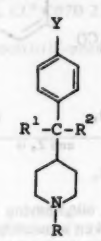
Robert Louis Duncan, Jr., and Robert Frederick Boswell, Jr., both of Richmond, Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

Filed Dec. 11, 1974, Ser. No. 531,832

Int. Cl.² C07D 295/00

U.S. Cl. 260—247.2 A 14 Claims

1. A 1-substituted-4-benzylpiperidine selected from those having the formula



wherein;

R is selected from the group consisting of p-fluorobenzoylpropyl, p-acetyl-o-methoxyphenoxypropyl, carbamoyl, N-lower-alkylcarbamoyl, N,N-dilower-alkylcarbamoyl, N-phenylcarbamoyl, N-(m-trifluoromethylphenyl)carbamoyl, N-(ω-morpholino)lower-alkylcarbamoyl, N-[ω-(2-pyridyl)loweralkyl]carbamoyl, 2-hydroxy-3-(o-methoxyphenoxy) propyloxycarbonyl, 2-carbamoylethyl or 4-(p-fluorobenzoyl) piperidinoethyl,

R^1 is selected from the group consisting of hydrogen or hydroxy,

R^2 is selected from the group consisting of phenyl, p-fluorophenyl, m-trifluoromethylphenyl or cyclohexyl,

Y is selected from the group consisting of hydrogen or fluorine,

with the proviso that when Y is hydrogen and R^2 is phenyl, R is other than p-fluorobenzoylpropyl, and

the pharmaceutically acceptable acid addition salts of the basic compounds thereof.

3,956,297

9H-DIBENZO[B,F]IMIDAZO[1,2-D][1,4]DIAZEPINES

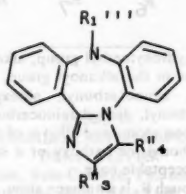
Martin Gall, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 424,665, Dec. 14, 1973, abandoned. This application Oct. 2, 1974, Ser. No. 511,437

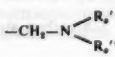
Int. Cl.² C07D 487/14

U.S. Cl. 260—247.5 EP 5 Claims

1. A compound of the formula v.80/12



wherein R_1''' is hydrogen or alkyl of 1 to 3 carbon atoms, inclusive; and wherein one of the parameters R''_3 or R''_4 is



and the other one is hydrogen or alkyl as defined above; wherein R_a' and R_a'' are hydrogen or alkyl defined as above, or together

is pyrrolidino, piperidino, N-methylpiperazino, or morpholino and the pharmacologically acceptable acid addition salts thereof.

3,956,298

N-(3-HYDROXYARYL-PROPYL)-IMIDES

Hanns Lind, Liestal, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

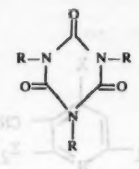
Filed Mar. 19, 1974, Ser. No. 452,763

Claims priority, application Switzerland, Apr. 11, 1973, 5163/73

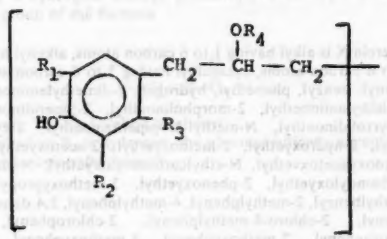
Int. Cl.² C07D 251/34

U.S. Cl. 260—248 NS 6 Claims

1. A compound of the formula



wherein R is



R_1 is an alkyl group of 1 to 8 carbon atoms, a cycloalkyl group of 6 to 8 carbon atoms, benzyl, α-methylbenzyl or α,α-dimethylbenzyl, R_2 is hydrogen, an alkyl group of 1 to 8 carbon atoms, a cycloalkyl group of 6 to 8 carbon atoms, benzyl, α-methylbenzyl, or α,α-dimethylbenzyl, R_3 is hydrogen or a methyl group, R_4 is hydrogen or a

group, R_5 is an alkyl group of 1 to 17 carbon atoms, a cyclohexyl group, a phenyl group, a phenyl group substituted by halogen, alkoxy of 1–18 carbon atoms, hydroxyl, alkyl of 1–12 carbon atoms or alkyl of 1–4 carbon atoms and hydroxyl groups, benzyl, phenethyl, phenylpropyl; benzyl, phenethyl or phenylpropyl substituted by hydroxyl groups in the phenyl radical; benzyl, phenethyl or phenylpropyl substituted by alkyl groups of 1–4 carbon atoms in the phenyl radical; or benzyl, phenethyl or phenylpropyl substituted by alkyl of 1–4 carbon atoms and hydroxyl groups in the phenyl radical.

3,956,299

PROCESS FOR THE PREPARATION OF CYANURIC ACID

Marinus J. A. M. den Otter, Munstergeleen; Lambertus P. G. Hawinkels, Montfort, and Augustinus P. H. Schouteten, Maastricht, all of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Apr. 24, 1975, Ser. No. 571,351

Claims priority, application Netherlands, Apr. 26, 1974, 7405629

Int. Cl.² C07D 251/32, 251/46, 251/52

U.S. Cl. 260—248 A 13 Claims

1. In a process for preparing cyanuric acid with low content of the by-products ammelide and ammeline by heating a solution of urea, biuret or mixtures thereof in a solvent while vapor is discharged, the improvement comprising undertaking the reaction in the presence of a carboxylic acid dissolved in the reaction mixture or of an anhydride or ammonium salt of a soluble carboxylic acid, said carboxylic acid containing up to 24 carbon atoms and present in an amount of at least 0.1 % by weight of the reaction mixture.

3,956,300

REACTIVE TRIAZINYL DYESTUFFS

Peter William Austin; Alan Thomas Costello, and Allen Crabtree, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

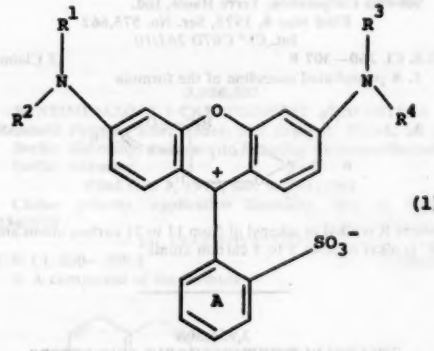
Filed Aug. 5, 1974, Ser. No. 495,122

Claims priority, application United Kingdom, Sept. 6, 1973, 41889/73

Int. Cl.² C07D 251/50, 251/44

U.S. Cl. 260—249.5 4 Claims

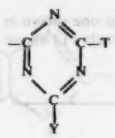
1. A dystuff of the formula



(1)

wherein

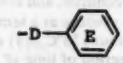
R^1 is H, benzyl, sulphobenzyl or alkyl containing 1-4 carbon atoms which can be substituted by OH, CN, OSO_3H, CO_2H, halogen, SO_3H or NHQ wherein Q represents a cellulose-reactive group of the triazine series having the formula



wherein

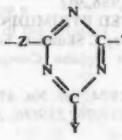
Y is halogen,

T is halogen; NH_2; alkoxy having 1-4 carbon atoms; alkylamino wherein the alkyl moiety has 1-4 carbon atoms; dialkylamino wherein each of the alkyl moieties has 1-4 carbon atoms; N-ω-sulphomethylanilino; naphthylamino substituted by 1 to 3 SO_3H groups;



wherein

D is —O—, —NH— or —NCH_3— and the phenyl ring E is substituted by 0-2 substituents selected from SO_3H, CO_2H, CH_3, OCH_3, Cl and sulphatoethylsulphonyl; and



wherein Y has the meaning given above, Z is the N,N'-divalent radical of a diamine selected from 1,3-phenylene diamine-4-sulphonic acid, 1,4-phenylene diamine-2-sulphonic acid, benzidine-2,2'-disulphonic acid, 4,4'-diaminostilbene-2,2'-disulphonic acid, 4,4'-diaminodiphenylurea-2,2'-disulphonic acid, 4,4'-diaminodiphenoxyethane-2,2'-disulphonic acid, 4,4'-diaminodibenzyl-2,2'-disulphonic acid and 2,6-diaminonaphthalene-4,8-disulphonic acid, and R^1 is selected from T wherein T has the meaning given above or an amino xanthene radical as defined above by formula (1) having —NH in place of NHQ,

R^2 is H, or alkyl containing 1-4 carbon atoms which can be substituted by OH, CN, OSO_3H, CO_2H, halogen or SO_3H,

R^3 is H or alkyl containing 1-4 carbon atoms which can be substituted by OH and

R^4 is benzyl which can be substituted by SO_3H or NHQ wherein Q has the meaning given above; alkyl containing 1-4 carbon atoms which can be substituted by OH, SO_3H or NHQ wherein Q has the meaning given above; or phenyl which can be substituted by SO_3H, CO_2H, halogen, alkyl having 1-4 carbon atoms, alkoxy having 1-4 carbon atoms or NHQ wherein Q has the meaning given above,

the benzene ring A can be further substituted by alkyl having 1-4 carbon atoms, alkoxy having 1-4 carbon atoms, halogen, NO_2 or NHQ wherein Q has the meaning given above, and wherein NR^1R^2 and NR^3R^4 are different and the dyestuff as a whole contains 1 or 2 cellulose reactive groups as defined by Q above and at least one further SO_3

group in addition to the one shown in its ionized state on benzene ring A in formula (1) above.

3,956,301

PROCESS FOR BROMINATION OF PYRIMIDINE

Thomas J. Kress, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 308,389, Nov. 21, 1972, abandoned. This application Mar. 24, 1975, Ser. No. 561,140
Int. Cl.² C07D 239/30
U.S. Cl. 260—251 R 6 Claims

1. In the process for brominating pyrimidine by heating a mixture of bromine and pyrimidine hydrochloride at an elevated temperature, the improvement which comprises the steps of (1) mixing a hydrogen halide salt of pyrimidine with a solvent selected from the group consisting of nitrobenzene, o-dichlorobenzene, benzonitrile, and o-nitrotoluene, (2) heating and maintaining the mixture at a temperature in the range of from about 125° to about 135°C., (3) adding bromine to the heated mixture over a period of time of about 30 to about 90 minutes, and (4) maintaining the reaction mixture at a temperature of from about 125° to about 135°C. for an additional period of time of about 2 hours to about 6 hours.

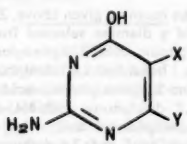
3,956,302

SUBSTITUTED PYRIMIDINES

James H. Hunter, and Harvey I. Skulnick, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed May 24, 1974, Ser. No. 473,013
Int. Cl.² C07D 239/30, 239/36, 239/42
U.S. Cl. 260—256.4 C 6 Claims

1. A compound of the formula:



wherein X is a member selected from the group consisting of bromo and iodo and Y is ethyl when X is bromo; or Y is a member selected from the group consisting of ethyl, n-propyl, benzyl and chloro when X is iodo; or the pharmacologically acceptable acid addition salts thereof.

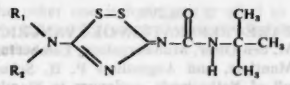
3,956,303

CERTAIN DITHIAZOLYLIDENE UREAS

Greg A. Bullock, 2225 Patwynn Road, Wilmington, Del. 19810, and Silas S. Sharp, 524 Rothbury Road, Wilmington, Del. 19803

Continuation-in-part of Ser. No. 404,795, Oct. 9, 1973, abandoned. This application Aug. 20, 1974, Ser. No. 499,046
Int. Cl.² C07D 285/00
U.S. Cl. 260—306.8 R 5 Claims

1. A compound of the formula

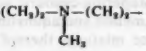


wherein

R_1 is hydrogen, methyl or ethyl;

R_2 is methyl, ethyl, methoxy, phenyl, dimethylamino or 2-(dimethylamino)ethyl;

R_1 and R_2 can be taken together to form



$-(CH_2)_n-$, or $-CH_2CH(CH_3)-O-CH(CH_3)CH_2-$, where n is 4 or 5, provided that, when R_1 is hydrogen, R_2 must be dimethylamino or 2-(dimethylamino)ethyl.

3,956,304

PREPARATION OF 2-METHYL-4-ISOPROPYLIDENE-2-OXAZOLIN-5-ONE

Werner Schwarze, Frankfurt, and Gerd Schreyer, Grossauheim both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

Filed Sept. 12, 1974, Ser. No. 505,607
Claims priority, application Germany, Sept. 12, 1973, 2345835
Int. Cl.² C07D 263/42
U.S. Cl. 260—307 A 13 Claims

1. A process for the production of 2-methyl-4-isopropylidene-2-oxazolin-5-one in a single step comprising reacting DL-valine with chloroacetyl chloride at a temperature between about 50° and 150°C., there being employed at least 1 mole of chloroacetyl chloride per mole of valine.

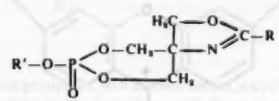
3,956,305

PHOSPHATED OXAZOLINES

Daniel G. Mudd, Mission Viejo, Calif., assignor to Commercial Solvents Corporation, Terre Haute, Ind.

Filed May 8, 1975, Ser. No. 575,662
Int. Cl.² C07D 263/10
U.S. Cl. 260—307 F 5 Claims

1. A phosphated oxazoline of the formula



where R is alkyl or alkenyl of from 11 to 21 carbon atoms and R′ is alkyl of from 1 to 5 carbon atoms.

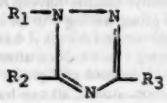
3,956,306

TRIAZOLYLTHIOPHOSPHORIC ACID ESTERS

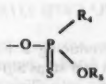
Dag Dawes, Pratteln, and Beat Bohner, Binningen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 20, 1972, Ser. No. 299,488
Claims priority, application Switzerland, Oct. 21, 1971, 15339/71
The portion of the term of this patent subsequent to Jan. 21, 1992, has been disclaimed.
Int. Cl.² C07D 249/12
U.S. Cl. 260—308 R 10 Claims

1. A compound of the formula



wherein R_1 represents a phenyl radical which is substituted by one or two fluorine or iodine atoms, by lower alkyl, lower alkoxy, lower alkylthio, trihalogeno-lower alkyl, lower alkyl-SO, lower alkyl-SO_2 or O_2N groups, which may be the same or different, or by one chlorine and one fluorine, bromine or iodine atom, one lower alkyl, lower alkoxy, lower alkylthio, trihalogeno-lower alkyl, lower alkyl-SO, lower alkyl-SO_2 or O_2N group, or represents an unsubstituted or halogenated or lower alkoxylated phenyl-lower alkyl radical or diphenylmethyl, R_2 represents hydrogen or a lower alkyl radical and R_3 represents the radical



wherein R_4 represents a lower alkyl radical or the phenyl radical and R_5 represents a lower alkyl radical.

3,956,307

BENZIMIDAZOLE-1-CARBOXIMIDIC ACID ESTERS

Reinhold Puttner; Kurt Röder, and Ernst A. Pieroh, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

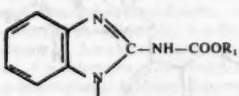
Filed Oct. 1, 1974, Ser. No. 511,092

Claims priority, application Germany, Oct. 2, 1973, 2349919

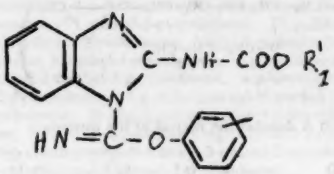
Int. Cl.² C07D *235/32*

U.S. Cl. 260—309.2 **2 Claims**

1. A compound of the formula



in which R_1 is alkyl or alkenyl each having from 1 to 4 carbons and R_2 is selected from the group consisting of trihalolower alkyl, phenyl, naphthyl, phenyl mono-, di-, or tri-substituted with alkyl or alkenyl each having from 1 to 12 carbons, cyclohexyl, lower alkoxy, lower alkylthio, lower alkoxycarbonyl, lower alkanoyl, lower alkanoylamino, di lower-alkylamino, trifluoromethyl, nitro, nitrile, halo, or the radicals



wherein R'₁ is methyl, ethyl, or isopropyl.

3,956,308

5-CHLOROTHIOIMINO IMIDAZOLIDINES

James D. Cleveland, Albany, Calif., assignor to Chevron Research Company, San Francisco, Calif.

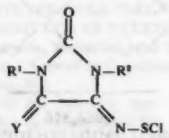
Division of Ser. No. 251,479, May 8, 1972, Pat. No. 3,843,677. This application Sept. 5, 1974, Ser. No. 498,508

The portion of the term of this patent subsequent to Oct. 22, 1991, has been disclaimed.

Int. Cl.² C07D *49/32*

U.S. Cl. 260—309.5 **9 Claims**

1. Compound of the formula



wherein Y is oxygen or sulfur; R^1 and R^2 are individually alkyl of 1 to 10 carbon atoms substituted with 0 to 6 halogens of atomic number 9 to 35, cycloalkyl of 3 to 10 carbon atoms substituted with 0 to 6 halogens of atomic number 9 to 35, or aryl of 6 to 12 carbon atoms substituted with 0 to 5 halogens of atomic number 9 to 35, nitro groups, alkoxy groups individually of 1 to 4 carbon atoms or 0 to 1 trihalomethyl, wherein the halogen is chlorine or fluorine.

3,956,309

POLYGLYCIDYL COMPOUNDS CONTAINING N-HETEROCYCLIC STRUCTURE

Jürgen Habermeier, Pfeffingen; Hans Batzer, Arlesheim, and Daniel Porret, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

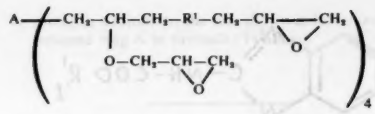
Division of Ser. No. 371,449, June 19, 1973, Pat. No. 3,900,493. This application June 30, 1975, Ser. No. 591,678

Claims priority, application Switzerland, June 23, 1972, 9528/72

Int. Cl.² C07D *233/72*

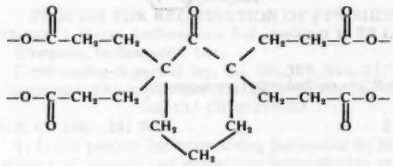
U.S. Cl. 260—309.5 **2 Claims**

1. A polyglycidyl compound of the formula

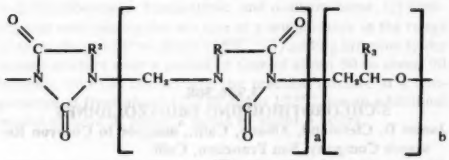


(I)

wherein A denotes the radical of the formula



R^1 denotes a divalent radical of the formula

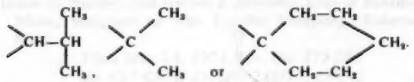


(II)

wherein *a* and *b* are identical or different and denote either 0 or 1;

R^3 is hydrogen or methyl;

and R^2 denotes one of the radicals



3,956,310
N-CARBAMOYL IMIDAZOLIDINONES AND IMIDAZOLIDINETHIONES

Alexander Michael Chalmers, Cheadle, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

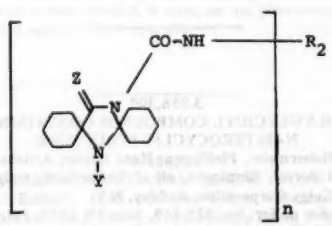
Filed Jan. 9, 1975, Ser. No. 539,376

Claims priority, application United Kingdom, Jan. 12, 1974, 1550/74

Int. Cl.² C07D *49/34*

U.S. Cl. 260—309.7 **11 Claims**

1. A compound having the formula



wherein *n* is 1 or 2, Y is O, hydrogen or a straight- or branched chain alkyl group having from 1 to 4 carbon atoms Z is O or S and when *n* is 1, R_1 is a straight or branched chain alkyl residue having from 1 to 20 carbon atoms; a straight- or branched chain alkenyl residue having from 3 to 18 carbon atoms; a cycloalkyl group having 5 to 14 carbon atoms or said cycloalkyl group substituted by alkyl having 1 to 12 carbon atoms or alkoxy having 1 to 4 carbon atoms; aryl group having 6 to 10 carbon atoms or said aryl group substituted by alkyl having 1 to 12 carbon atoms, alkoxy having 1 to 4 carbon atoms or one or two chlorine atoms; or an aralkyl group having from 7 to 18 carbon atoms, and when *n* is 2, R_2 is a straight or branched alkylene having from 2 to 20 carbon atoms; arylene having from 6 to 18 carbon atoms or said arylene substituted by methyl; or an aralkylene group having from 7 to 18 carbon atoms, and salts of said compounds wherein the salt is a phosphate, carbonate, sulphate, chloride, acetate, stearate, maleate, citrate, tartrate, oxalate benzoate or substituted carbamate.

3,956,311
PROCESS FOR THE PREPARATION OF 3-ANILINO-PYRAZOLONES-(5)

Karl Kuffner; Ernst Meier, both of Munich, and Hans Glockner, Pullach, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Continuation-in-part of Ser. No. 175,702, Aug. 27, 1971, abandoned. This application Aug. 8, 1973, Ser. No. 386,582

Claims priority, application Germany, Aug. 29, 1970, 2042821

Int. Cl.² C07D *231/08*

U.S. Cl. 260—310 A **1 Claim**

1. In the process of producing a 1-aryl-3-anilino-pyrazolone-(5) by condensing in two steps a β-substituted acid ester with an aryl hydrazine and an aniline, the improvement according to which

the first step of the condensation is effected between the aryl hydrazine and the β-substituted acid ester in methanolic solution with acetic acid as catalyst to form a β-alkoxy-β-aryl-hydrazino-acrylic acid ester wherein the β-substituted acid ester is a β,β,β-trialkoxy-propionic acid ester, a β-imino-β-alkoxypropionic acid ester, or a β,β-dialkoxy-acrylic acid ester,

and the second step of the condensation is effected between the aniline and the reaction product of the first step with acetic acid as catalyst.

3,956,312
INDAZOLE-3-CARBOXYLIC ACID HYDRAZIDES AND A PROCESS FOR THE PREPARATION THEREOF

László Magdányi; Lujza Petőcz; Enikő Kiszelly; Ibolya Kosóczky, and Attila Varga, all of Budapest, Hungary, assignors to Egyt Gyogyszervegyeszeti Gyar, Budapest, Hungary

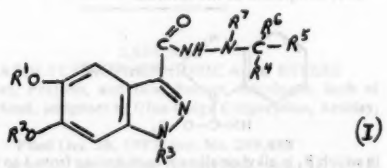
Filed Aug. 15, 1974, Ser. No. 497,676

Claims priority, application Hungary, Aug. 16, 1973, EE 2169

Int. Cl.² C07D *231/56*

U.S. Cl. 260—310 C **4 Claims**

1. A compound of the formula (I)



(I)

wherein one of R^4 and R^5 is hydrogen and the other is phenyl, substituted phenyl, phenylalkyl or substituted phenylalkyl, wherein said substituted phenyl groups contain 1 to 3 alkyl, C_{1-3} alkoxy, hydroxyl benzyloxy, nitro, amino, lower alkyl-

amino, di-lower alkylamino, methylenedioxy, alkyl-mercapto, alkylsulfonyl or halogen substituents, R^1 and R^2 are always the same and represent a C_{1-4} alkyl group, R^3 is hydrogen and R^6 and R^7 are hydrogen or R^6 and R^7 form together a valence bond; or a pharmaceutically acceptable salt thereof.

3,956,313

N-(SUBSTITUTED-THIOMETHYL)-2-PYRROLIDINONES

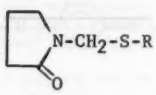
Harlan B. Freyermuth, and David I. Randall, both of Easton, Pa., assignors to GAF Corporation, New York, N.Y.

Filed Apr. 13, 1970, Ser. No. 28,010

Int. Cl.² C07D *207/26*

U.S. Cl. 260—326.5 S **3 Claims**

2. A process for the preparation of a compound of the formula:



wherein R is selected from the group consisting of methyl, ethyl, n-propyl, isopropyl, n-butyl, isobutyl, n-pentyl, n-hexyl, nonyl, decyl, dodecyl, hydroxymethyl, 2-hydroxyethyl, 3-hydroxypropyl, chloromethyl, ethenyl, propenyl, propargyl, butynyl, cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, cycloheptyl, cyclooctyl, phenyl, tolyl, o-, m- and p-xylyl, 1-naphthyl, 2-naphthyl, benzyl and phenethyl, which comprises reacting N-hydroxymethyl-2-pyrrolidinone with a mercaptan of the formula:

R—SH

wherein R is as described above, in the presence of an acidic catalyst and at a temperature of from about 20°C to about 50°C.

3,956,314

DERIVATIVES OF 2-PYRROLIDINONE

Joseph Honore Strubbe, Dilbeek, and Raymond Armand Linz, Brussels, both of Belgium, assignors to U.C.B., Societe Anonyme, Saint-Gilles-lez-Bruxelles, Belgium

Continuation-in-part of Ser. No. 165,342, July 22, 1971, abandoned. This application Nov. 20, 1973, Ser. No. 417,528

Claims priority, application United Kingdom, July 24, 1970, 35948/70

Int. Cl.² C07D *207/26*

U.S. Cl. 260—326.5 FL **11 Claims**

1. A compound selected from the group consisting of 4-p-chlorophenyl-3-ethyl-2-pyrrolidinone, 4-p-chlorophenyl-3-methyl-2-pyrrolidinone, 4-p-chlorophenyl-3-phenyl-2-pyrrolidinone, 4-o-chlorophenyl-3-phenyl-2-pyrrolidinone, 4-p-fluorophenyl-3-methyl-2pyrrolidinone, 4-p-chlorophenyl-N-methyl-3-phenyl-2-pyrrolidinone, 4-p-fluorophenyl-3-phenyl-2-pyrrolidinone, 3-o-chlorophenyl-4-p-chlorophenyl-2-pyrrolidinone, 4-p-chlorophenyl-4-phenyl-2-pyrrolidinone, N-benzyl-4-p-chlorophenyl-3-phenyl-2-pyrrolidinone, 4-p-chlorophenyl-5-ethyl-3-phenyl-2-pyrrolidinone, 4-p-chlorophenyl-3-phenyl-N-(2-propynyl)-2-pyrrolidinone, 4-p-chlorophenyl-N-cyclopentyl-3-phenyl-2-pyrrolidinone, 3-allyl-3-p-chlorophenyl-5-phenyl-2-pyrrolidinone, 3-phenyl-4-m-trifluoromethylphenyl-2-pyrrolidinone, 4-p-chlorophenyl-3,3-dimethyl-2-pyrrolidinone, 3,4-bis-p-chlorophenyl-2-pyrrolidinone, 3-p-chlorophenyl-4-phenyl-2-pyrrolidinone, 4-m-chlorophenyl-3-phenyl-2-pyrrolidinone, 4-m-fluorophenyl-3-phenyl-2-pyrrolidinone, 4-p-chlorophenyl-4-methyl-3-phenyl-2-pyrrolidinone, 4-o-fluorophenyl-3-phenyl-2-pyrrolidinone, 4-p-chlorophenyl-5-methyl-2-pyrrolidinone, 4-p-chlorophenyl-5,5-dimethyl-2-pyrrolidinone, 3-allyl-3-p-chlorophenyl-2-pyrrolidinone, 3-methyl-4-p-nitrophenyl-2-pyrrolidinone, 4-p-aminophenyl-3-methyl-2-pyrrolidinone, 4-p-bromophenyl-3-methyl-2-pyrrolidinone, 4-p-chlorophenyl-N-methyl-3-methyl-2-pyrrolidinone, N-allyl-4-p-chlorophenyl-3-phenyl-2-pyrrolidinone, N-n-butyl-4-p-chlorophenyl-3-phenyl-2-pyrrolidinone, 4-p-chlorophenyl-N-n-hexyl-3-phenyl-2-pyrrolidinone and 4-p-chlorophenyl-5-phenyl-2-pyrrolidinone.

3,956,315

HERBICIDAL N-(3-CYANO-4-ALKYLTHIEN-2-YL) UREAS

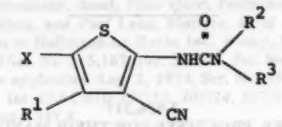
John W. Kobzina, Walnut Creek, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 21, 1974, Ser. No. 453,231

Int. Cl.² C07D *333/24*

U.S. Cl. 260—332.2 A **3 Claims**

1. A compound of the formula



wherein X is hydrogen; R^1 is alkyl of 3 to 6 carbon atoms; R^2 is hydrogen; and R^3 is alkyl of 1 to 6 carbon atoms.

3,956,316

11-SUBSTITUTED-DESA-PREGNANES AND DERIVATIVES THEREOF

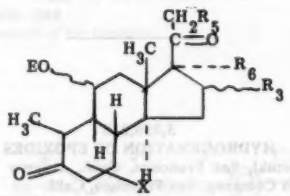
Milan Radoje Uskokovic, Montclair, and Thomas Henry Williams, Cedar Grove, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 306,496, Nov. 14, 1972, Pat. No. 3,830,831, which is a continuation of Ser. No. 736,569, June 13, 1968, abandoned, which is a division of Ser. No. 499,094, Oct. 20, 1965, Pat. No. 3,574,761, which is a continuation-in-part of Ser. No. 400,206, Sept. 29, 1964, Pat. No. 3,412,107. This application Dec. 26, 1973, Ser. No. 427,753

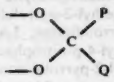
Int. Cl.² C07D *317/44*, *317/72*; C07C *49/38*, *69/14*

U.S. Cl. 260—340.5 **5 Claims**

1. A compound of the formula:



wherein R_5 is selected from the group consisting of hydrogen, fluoro, lower alkyl, hydroxy, benzoyloxy and lower alkanoyloxy; R_6 is selected from the group consisting of hydrogen, lower alkyl, hydroxy, benzoyloxy, lower alkanoyloxy and halogen; EO is benzoyloxy, lower alkanoyloxy or free hydroxy; when R_5 and R_6 are hydroxy they may be taken together with an aldehyde or ketone to form an acetal or ketal of the formula:



wherein P is individually selected from the group consisting of hydrogen and lower alkyl; Q is individually selected from the group consisting of lower alkyl, phenyl, phenyl substituted with radicals selected from the group consisting of halogen, lower alkoxy, hydroxy and lower alkyl, phenyl-lower-alkyl or phenyl-lower-alkyl aromatically substituted with radicals selected from the group consisting of halogen, lower alkoxy, hydroxy and lower alkylcyano; and P and Q taken together are lower alkylene; R_3 is selected from the group consisting of hydrogen and halogen; X is a substituent in the 6-position selected from the group consisting of hydrogen, lower alkyl, lower alkylthio and lower alkanoylthio or a substituent in the 7-position selected from the group consisting of hydrogen, lower alkyl, lower alkylthio, lower alkanoylthio and halogen.

3,956,317

DIEPOXIDES, PROCESSES FOR THEIR MANUFACTURE AND USE

Hans Batzer, Ariesheim; Juergen Habermeier, Allschwil, and Daniel Porret, Binningen, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

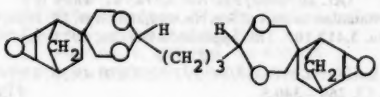
Division of Ser. No. 371,009, June 18, 1973, Pat. No. 3,879,422, which is a division of Ser. No. 113,717, Feb. 8, 1971, Pat. No. 3,759,954. This application Feb. 21, 1975, Ser. No. 551,797

Claims priority, application Switzerland, Feb. 13, 1970, 2136/70

Int. Cl.² C07D *319/04*

U.S. Cl. 260—340.7 **1 Claim**

1. A diepoxide of the formula:



3,956,318

HYDROGENATION OF EPOXIDES

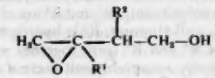
Shigeto Suzuki, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jan. 29, 1975, Ser. No. 545,253

Int. Cl.² C07D *307/08*

U.S. Cl. 260—346.1 R **8 Claims**

1. A process for producing a substituted tetrahydrofuran which comprises contacting an epoxide with molecular hydrogen and a Group VIII metal hydrogenation catalyst at a temperature between 50° and 250°C and a pressure between 10 and 5,000 psig, wherein the contacting is carried out in the liquid phase and in the presence of a protonic acid, and the epoxide has the formula



wherein R^1 is a methyl, ethyl, propyl or butyl group and wherein R^2 is hydrogen, methyl, ethyl, propyl or butyl and wherein the Group VIII metal hydrogenation catalyst comprises iron, cobalt, nickel, ruthenium, rhodium, palladium, osmium, iridium, or platinum, wherein the metal is present in the catalyst in elemental, oxide, or sulfide form.

3,956,319

ORGANIC PEROXIDES DERIVED FROM UNSATURATED COMPOUNDS

Egeo Sacrini, and Claudio Cavallotti, both of Milan, Italy, assignors to The B. F. Goodrich Company, Akron, Ohio

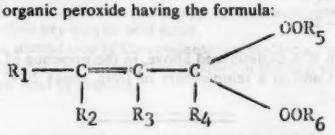
Division of Ser. No. 53,267, July 8, 1970, Pat. No. 3,896,176. This application Mar. 3, 1975, Ser. No. 554,473

Claims priority, application Italy, July 29, 1969, 20222/69

Int. Cl.² C07C *307/00, 179/00*

U.S. Cl. 260—346.1 R **9 Claims**

1. An organic peroxide having the formula:



wherein R_1 is selected from the group consisting of furyl, alkyl substituted furyl radicals having 4–15 carbon atoms; R_2 is selected from the group consisting of hydrogen, alkyl radicals having 1–12 carbon atoms, cycloalkyl, alkyl substituted cycloalkyl radicals having 5–20 carbon atoms, alkyl radicals having 1–12 carbon atoms, and phenyl and alkyl substituted phhenyl radicals; R_3 and R_4 are each selected from the group consisting of hydrogen, alkyl radicals having 1–12 carbon atoms, cycloalkyl and, alkyl substituted cycloalkyl radicals having 5–20 carbon atoms; phenyl and alkyl substituted phenyl radicals having 6–20 carbon atoms; alkyl radicals having 1–12 carbon atoms, phenylalkyl radicals having 7–20 carbon atoms; and R_3 and R_4 taken together with the two adjacent carbon atoms to which they are respectively bonded may form a cycloaliphatic ring selected from the group consisting of alkyl, phenyl, phenylalkyl, alkylidene, phenylalkylidene and hydroxyphenylalkylidene substituted cycloaliphatic rings having 5–25 carbon atoms; R_5 and R_6 are each selected from the group consisting of alkyl radicals having 4–12 carbon atoms, phenylalkyl radicals having 9–18 carbon atoms; cyclalkyl and alkyl substituted cycloalkyl radicals having 5–21 carbon atoms; phenylcycloalkyl and alkyl substituted phenylcycloalkyl radicals having 9–25 carbon atoms; alkyl radicals having 4–12 carbon atoms and phenylalkyl radicals having 9–18 carbon atoms.

4. The peroxide of claim 1 which is selected from the group consisting of

1-furyl-3,3-di(ter.-butyl-peroxy)-propene-1;

1-furyl-2-methyl-3,3-di(ter.-butyl-peroxy)-propene-1.

3,956,320

AROMATIC BIS(ETHER PHTHALIS ANHYDRIDE) COMPOUNDS

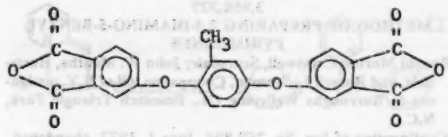
Darrell R. Heath, Overland Park, Kans., and Joseph G. Wirth, Ballston Lake, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 281,749, Aug. 18, 1972, which is a continuation-in-part of Ser. No. 108,151, Jan. 20, 1971, Pat. No. 3,787,475. This application Aug. 2, 1974, Ser. No. 494,238

Int. Cl.² C07D *307/89*

U.S. Cl. 260—346.3 9 Claims

1. The compound



3,956,321

PREPARATION OF 4-FLUOROPHTHALIC ANHYDRIDE

Ronald L. Markezich, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 30, 1975, Ser. No. 545,480

Int. Cl.² C07D *307/89*

U.S. Cl. 260—346.3 1 Claim

1. The process for making 4-fluorophthalic anhydride which comprises reacting 4-nitrophthalic anhydride with potassium fluoride at a temperature of from 75° to 200° C. in a solvent consisting essentially of acetonitrile and a crown ether.

3,956,322

DIANHYDRIDES OF BIS-(ORTHODICARBOXYPHENYLOXYPHENYL)ACETYLENE AND BIS-(ORTHO-DICARBOXYPHENYLOXYPHENYL)2,2-DICHLOROETHYLENE

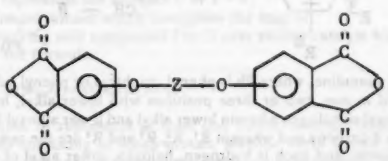
Clayton B. Quinn, and Frank J. Williams, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 14, 1975, Ser. No. 558,222

Int. Cl.² C07D *307/89*

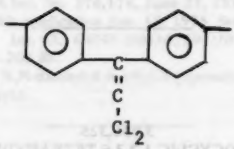
U.S. Cl. 260—346.3 4 Claims

1. A composition of matter having the formula



where Z is a member selected from the class consisting of the

group and the



group.

3,956,323

FURAN, BENZOFURAN AND TETRAHYDROFURAN CARBOXYLIC ACID ESTERS

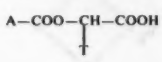
Andre Furlenmeier, Basel; Peter Quitt, Fullinsdorf; Karl Vogler, Riehen, and Paul Lanz, Muttenz, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 215,187, Jan. 3, 1972, Pat. No. 3,839,322. This application Aug. 2, 1974, Ser. No. 494,144

Int. Cl.² C07D *307/56, 307/24, 307/85*

U.S. Cl. 260—347.5 5 Claims

1. A compound represented by the formula



wherein A is selected from the group consisting of furyl, tetrahydrofuryl and benzofuranyl and T is selected from the group consisting of C_2 - C_3 alkyl, C_2 - C_3 alkenyl, cyclopropylmethyl, cyclobutylmethyl and cyclopentyl.

3,956,324

ANTHRAQUINONE DYESTUFFS

Max Jost, Oberwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

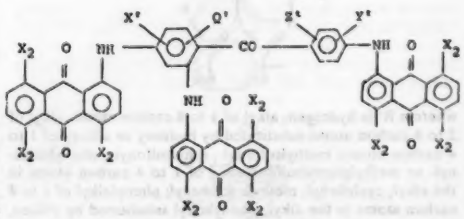
Filed Jan. 10, 1975, Ser. No. 540,058

Claims priority, application Switzerland, Jan. 16, 1974, 570/74

Int. Cl.² C07C *97/24, 49/68*

U.S. Cl. 260—368 3 Claims

1. A dyestuff of the formula



wherein one X_2 is hydrogen, phenoxy, phenylmercapto, phenylamino, benzoylamino which may be substituted by chloro, methyl or methoxy, the remaining X_2 is hydrogen, and Q', X' and Z' is hydrogen or methyl.

3,956,325

5-HETEROCYCLIC-1,2,3,6-TETRAHYDRO-4(5H) PYRIMIDINONE

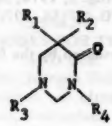
Bernard Loev, Broomall, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 435,048, Jan. 21, 1974, Pat. No. 3,910,914. This application June 6, 1975, Ser. No. 584,327

Int. Cl.² C07D *239/04, 401/04, 417/04*

U.S. Cl. 260—256.4 C **4 Claims**

1. A compound of the formula:



in which:

R_1 is 2-pyridyl, 2-pyrimidinyl, 4-pyrimidinyl, 2-pyrazinyl, 2-pyrrolyl, 2-quinolyl, 2-thiazolyl or 4-thiazolyl;

R_2 is lower alkyl or phenyl optionally substituted with halogen, lower alkyl or lower alkoxy; and

R_3 and R_4 are hydrogen or lower alkyl

or a pharmaceutically acceptable acid addition salt thereof.

3,956,326

3-AMINO-ISOTHIAZOLO[3,4-D]PYRIMIDINES

Rolf Niess, Schifferstadt, and Heinz Eilingsfeld, Frankenthal, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

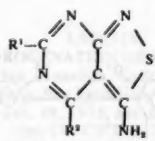
Filed Oct. 21, 1974, Ser. No. 516,613

Claims priority, application Germany, Nov. 2, 1973, 2354685

Int. Cl.² C07D *239/00, 295/00*

U.S. Cl. 260—256.5 R **4 Claims**

1. A compound of the formula



wherein R^1 is hydrogen; alkyl of 1 to 8 carbon atoms; alkyl of 2 to 8 carbon atoms substituted by hydroxy or alkoxy of 1 to 4 carbon atoms; methylsulfonyl-, ethylsulfonyl-, phenylsulfonyl- or methylphenylsulfonylalkyl of 1 to 4 carbon atoms in the alkyl; cyclohexyl; methylcyclohexyl; phenylalkyl of 1 to 4 carbon atoms in the alkyl; phenylalkyl substituted by chloro, bromo, methyl, ethyl, methoxy or ethoxy and having 1 to 4 carbon atoms in the alkyl; phenyl; phenyl substituted by chloro, bromo, methyl, ethyl, methoxy or ethoxy; dialkylamino of 1 to 4 carbon atoms in the alkyl; dialkylamino of 1 to 4 carbon atoms in the alkyl and substituted by hydroxy; alkylmercapto of 1 to 8 carbon atoms; alkylmercapto of 1 to 4 carbon atoms substituted by alkoxycarbonyl of 1 to 4 carbon atoms in the alkoxy, carbamoyl, N-C_1 to C_4-alkylcarbamoyl, N,N-C_1 to C_4-dialkylcarbamoyl, N-cyclohexylcarbamoyl, N-benzylcarbamoyl, N-phenylethylcarbamoyl or N-phenylcarbamoyl; benzylmercapto; phenylmercapto; phenylmercapto substituted by chloro, methyl, methoxy or ethoxy; CH_3COCH_2S or $C_6H_5COCH_2S$ and R^2 is hydrogen or methyl.

3,956,327

METHOD OF PREPARING 2,4-DIAMINO-5-BENZYL PYRIMIDINES

Ronald Morton Cresswell, Scarsdale; John W. Mentha, Hartsdale, and Russell L. Seaman, Chappaqua, all of N.Y., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

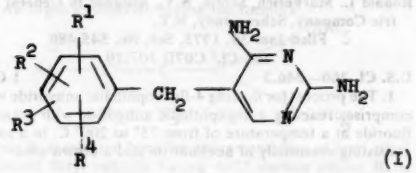
Continuation of Ser. No. 258,804, June 1, 1972, abandoned, which is a division of Ser. No. 16,606, March 4, 1970, Pat. No. 3,697,512. This application June 24, 1974, Ser. No. 482,144

Claims priority, application United Kingdom, Mar. 6, 1969, 11908/69; Mar. 6, 1969, 11909/69; May 16, 1969, 25171/69; June 13, 1969, 30247/69

Int. Cl.² C07D *239/48*

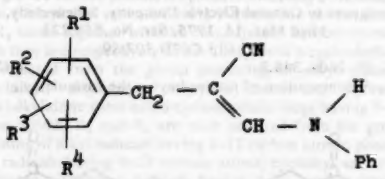
U.S. Cl. 260—256.4 N **12 Claims**

1. A method of preparing a compound of formula I



(I)

which comprises the step of heating a mixture of a compound



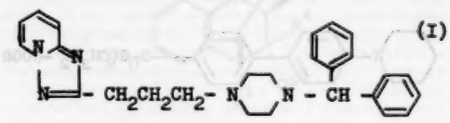
and guanidine, where Ph is phenyl, naphthyl or phenyl substituted in one, two or three positions with lower alkyl, lower alkoxyl or halogen wherein lower alkyl and lower alkoxyl have 1 to 4 carbons and wherein R^1, R^2, R^3 and R^4 are the same or different, and each is hydrogen, halogen, lower alkyl of 1 to 4 carbon atoms, lower alkoxy of 1 to 4 carbon atoms or benzyloxy, or R^3 and R^4 taken together may be methylenedioxy when both R^1 and R^2 are hydrogen.

3,956,328
S-TRIAZOLO(1,5-A)PYRIDINE DERIVATIVE

Tsutomu Irikura, Oizumigakuen, Japan, assignor to Kyorin Seiyaku Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 4, 1974, Ser. No. 503,089
Claims priority, application Japan, Oct. 30, 1973, 48-121975
Int. Cl.² C07D *401/14*
U.S. Cl. 260—268 BC 3 Claims

1. A compound of the formula (I),



(I)

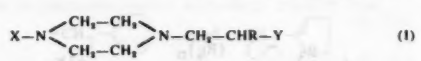
or non-toxic acid addition salts thereof.

3,956,329
PROCESS FOR PREPARING NITROGEN-CONTAINING HETEROCYCLIC COMPOUNDS

Ryuzo Murakami; Shigeaki Kato, and Hiroshi Mitarashi, all of Tokuyama, Japan, assignors to Shunan Petrochemical Company, Ltd., Tokyo, Japan

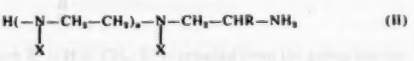
Filed July 19, 1974, Ser. No. 489,926
Claims priority, application Japan, July 19, 1973, 48-82278
Int. Cl.² C07D *295/02*
U.S. Cl. 260—268 SY 5 Claims

1. In a process for preparing a nitrogen-containing heterocyclic compound by cracking cyclization of a compound of the formula:



(I)

or



(II)

wherein

X represents hydrogen or $-CH_2-CHR-Y$;

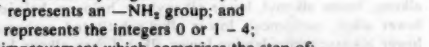
R represents hydrogen or methyl;

Y represents an $-NH_2$ group; and

n represents the integers 0 or 1 – 4;

the improvement which comprises the step of:

cracking said compound I or II over zeolite catalyst having the formula:



(III)

wherein M represents at least one cation selected from the group consisting of alkali metals, alkaline earth metals, zinc group elements, hydrogen and ammonium cations; n represents the valence of the cation; a represents the number of 1.0 ± 0.5, regardless of the type and number of cations and m represents the numbers of 2 – 12.

3,956,330
N,N-DIETHYL-4-METHYL-1-PI-PERAZINECARBOXAMIDE PAMOATE

Howard Seebree Corey, Jr., New City; William Charles Barringer, Pearl River, and Lloyd Frank Hansen, Campbell Hall, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 374,174, June 27, 1973, Pat. No. 3,895,111. This application Jan. 13, 1975, Ser. No. 540,737
Int. Cl.² C07D *295/18, 295/20*
U.S. Cl. 260—268 BC 3 Claims

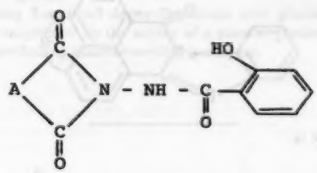
1. A salt of N,N-diethyl-4-methyl-1-piperazinecarboxamide with pamoic acid.

3,956,331
N-(SALICYLOYLAMINO)IMIDES AND PROCESS FOR THE PREPARATION OF THE SAME

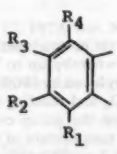
Toshio Yoshikawa; Nagayoshi Sakamoto, and Tomitada Nagamori, all of Ichihara, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed Aug. 1, 1974, Ser. No. 493,514
Claims priority, application Japan, Feb. 26, 1974, 49-21944
Int. Cl.² C07D *217/24, 209/48*
U.S. Cl. 260—281 N 9 Claims

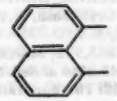
1. N-(salicyloylamino)imide represented by the formula



in which A represents a group



in which R_1–R_4 represent hydrogen atoms, halogen atoms, hydroxyl groups, straight chain alkyl groups having from 1 to 5 carbon atoms, alkoxyl groups having from 1 to 5 carbon atoms, or alkylthio groups having from 1 to 5 carbon atoms, and one of R_1 – R_4 can be replaced with a nitro group, a carboxyl group or a branched chain alkyl group having from 1 to 5 carbon atoms;



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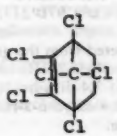

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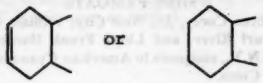


3,956,332

FAST, BROWN SULFUR DYESTUFFS AND PROCESS FOR THE PREPARATION THEREOF

Erwin Krusche, Frankfurt am Main; Joachim Ribka, Offenbach (Main), and Eberhard Stier, Frankfurt am Main, all of Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Germany

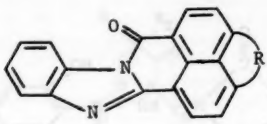
Filed June 26, 1974, Ser. No. 483,373

Claims priority, application Germany, Sept. 21, 1973, 2347537

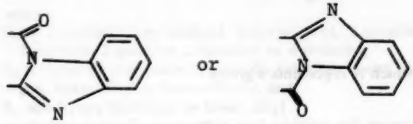
Int. Cl.² C07D 487/04

U.S. Cl. 260—282 19 Claims

1. A process of producing a fast, brown sulfur dyestuff which comprises the steps of dissolving at least one compound of the formula



wherein R is



in chlorosulfonic acid or in compositions of chlorosulfonic acid and sulfuric acid whereby up to 70% by weight of the chlorosulfonic acid is replaced by 100% sulfuric acid or oleum with up to 20% free SO_3 and reacting resulting solution with a member selected from the group consisting of sulfur and disulfur dichloride at a temperature of from 10° to 120°C. for a reaction time of from 1 to 40 hours.

11. The product produced by the process of claim 1.

3,956,333

1(OR 3)-PERFLUOROALKYL-3,4-DIHYDRO-2(1H)-ISOQUINOLINECARBONITRILES

Denis M. Bailey, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 453,592, March 22, 1974, Pat. No. 3,927,000, which is a division of Ser. No. 282,266, Aug. 21, 1972, Pat. No. 3,855,228. This application June 19, 1975, Ser. No. 588,370

Int. Cl.² C07D 217/00

U.S. Cl. 260—283 CN 4 Claims

1. A compound selected from the group consisting of 3,4-dihydro-1-(pentafluoroethyl)-2(1H)-isoquinolinecarbonitrile, 1-(heptafluoropropyl)-3,4-dihydro-2(1H)-isoquinolinecarbonitrile and 3,4-dihydro-3-(trifluoromethyl)-2(1H)-isoquinolinecarbonitrile.

3,956,334

2-METHYL-2-[4-(4-PIPERIDINOPHENYL)-PHENOXY]-PROPIONIC ACID 1-METHYL-4-PIPERIDYL ESTER

Erich Schacht; Werner Mehrhof; Herbert Nowak, and Zdenek Simane, all of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

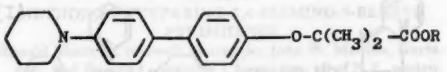
Filed June 26, 1974, Ser. No. 483,408

Claims priority, application Germany, June 28, 1973, 2332801

Int. Cl.² C07D 211/46

U.S. Cl. 260—293.64 2 Claims

1. A compound of the formula



wherein R is 1-methyl-4-piperidyl, or a physiologically acceptable salt thereof.

3,956,335

1-SUBSTITUTED-4-(2-OXO-1-IMIDAZOLIDINYL) PIPERIDINES

Max Wilhelm, Watchung, N.J.; Kurt Eichenberger, Therwil, Switzerland; Herbert Schroter, Fullinsdorf, Switzerland, and Franz Ostermayer, Rhine, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

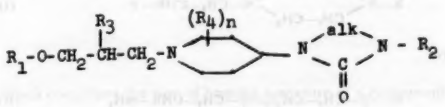
Continuation-in-part of Ser. No. 389,106, Aug. 16, 1973, abandoned. This application June 27, 1974, Ser. No. 483,742

Claims priority, application Switzerland, Apr. 30, 1974, 5907/74; July 3, 1973, 9670/73; Aug. 24, 1972, 12539/72

Int. Cl.² C07D 211/58

U.S. Cl. 260—293.7 8 Claims

1. A piperidine of the formula



wherein R_1 is a phenyl, naphthyl, 5,6,7,8-tetrahydro-1-naphthyl or 5,6,7,8-tetrahydro-2-naphthyl radical which is unsubstituted, monosubstituted or disubstituted by lower alkyl, lower alkoxy, lower alkenyl, lower alkenyloxy, halogen, halogeno-lower alkyl, carbamoyl, lower alkyl-substituted carbamoyl, lower alkoxycarbonylamino-lower alkyl, lower alkoxy-lower alkoxy, lower alkanoylamino- ethenyl, lower alkylthio-lower alkoxy, hydroxyl, lower alkanoyl, lower alkoxy-lower alkyl, lower alkynyl, lower alkylthio-lower alkyl, hydroxy-lower alkyl, lower alkanoyloxy, lower alkylthio, lower alkanoyl amino, cyano, amino, nitro, ureido, lower alkylated ureido, phenyl-lower alkoxy, and/or lower alkynyloxy, R_2 is hydrogen, lower alkyl, lower alkenyl, α-phenyl-lower alkyl or lower alkanoyl, R_3 is a free hydroxyl group, a lower alkanoyloxy group or a lower alkoxy group, R_4 is hydrogen or lower alkyl, n is an integer from 0 to 4, and alk is an optionally mono-lower alkylated ethylene radical, or a salt thereof.

3,956,336

9-ALKOXY-5-METHYL-6,7-BENZOMORPHANS

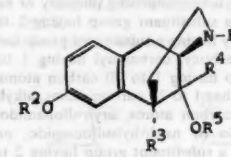
Thomas Alfred Montzka, Manlius, and John Daniel Matiskella, Liverpool, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 462,007, April 18, 1974, abandoned. This application Mar. 26, 1975, Ser. No. 562,077

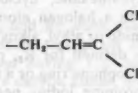
Int. Cl.² C07D *39/00*

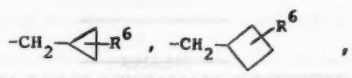
U.S. Cl. 260—293.54 34 Claims

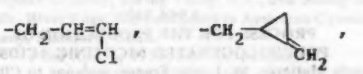
1. A compound having the formula

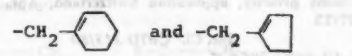


wherein R^1 is selected from the group consisting of H, $-CH_2-C\equiv CH$, $-CH_2-CH=CH_2$,

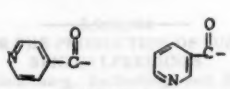


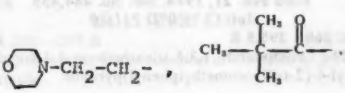


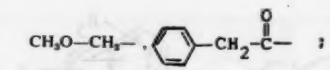




in which R^6 is H or CH_3; R^2 is selected from the group consisting of H, (lower)alkyl, (lower)alkanoyl,







R^5 is selected from the group consisting of (lower)alkyl, allyl and propargyl, R^4 is H or (lower)alkyl and R^3 is (lower)alkyl or (lower)alkenyl; or a pharmaceutically acceptable acid addition salt thereof.

3,956,337

PROCESS FOR THE PREPARATION OF D-GLUCONIC-δ-LACTAM

Tomizo Niwa, Yokohama; Takashi Tsuruoka, Kawasaki; Takashi Shomura; Shigeharu Inouye, both of Yokohama; Kazuo Saito, Fujisawa, and Taro Nilda, Yokohama, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Filed Sept. 24, 1974, Ser. No. 508,734

Claims priority, application Japan, Sept. 25, 1973, 48-106928

Int. Cl.² C07D *211/74*

U.S. Cl. 260—293.86 4 Claims

1. A process for the preparation of D-gluconic-δ-lactam, which comprises:

oxidizing 5-amino-5-deoxy-D-glucose with glucose-oxidizing enzyme or by the action of a microorganism capable of producing glucose-oxidizing enzyme.

3,956,338

4,6-DIBROMO-5-HYDROXY-2-PYRIDINE NITRILE COMPOUNDS AND METHOD OF PREPARATION

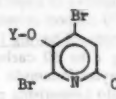
Alin H. Gulbenk, and Sven H. Ruetman, both of Walnut Creek, Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 17, 1975, Ser. No. 541,811

Int. Cl.² C07D *213/57*

U.S. Cl. 260—294.9 3 Claims

1. A compound of the formula



wherein Y is H or a cation of lithium, sodium, potassium, calcium, magnesium, barium, aluminum, a metal of atomic number 24 through 30, or tin.

3,956,339

4-PYRIDINIO-5-PYRAZOLONE SALTS, PROCESS FOR THEIR PREPARATION AND THEIR USE

Nobuo Furutachi, and Atsuaki Arai, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

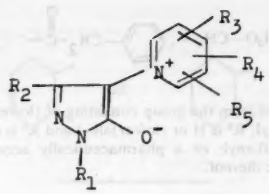
Filed Sept. 17, 1974, Ser. No. 506,808

Claims priority, application Japan, Sept. 17, 1973, 48-104762

Int. Cl.² C07D *213/38*, *213/40*

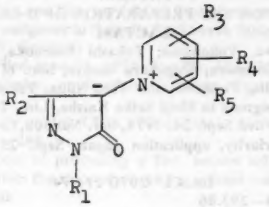
U.S. Cl. 260—295 R 9 Claims

1. A 4-pyridinio-5-pyrazolone salt represented by the following formula (IV*a*)



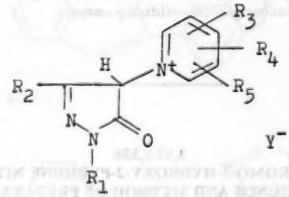
(IVa)

the formula (IV*b*)



(IVb)

the formula (VI)



(VI)

or a mixture thereof, wherein R_1 represents a hydrogen atom; sulfamoyl; alkyl having 1 to 40 carbon atoms, alkoxycarbonyl having 1 to 40 carbon atoms, carboxy having 1 to 40 carbon atoms, aryl having 1 to 40 carbon atoms, aryl comprising phenyl substituted with alkyl having 1 to 30 carbon atoms, alkoxy having 1 to 30 carbon atoms, aryloxy comprising phenoxy or naphthoxy, or phenoxy or naphthoxy having a substituent group having 1 to 10 carbon atoms, acylamino having 1 to 30 carbon atoms, carbamoyl having 1 to 30 carbon atoms, alkylsulfonamido having 1 to 30 carbon atims, arylsulfonamido comprising phenylsulfonamido or naphthylsulfonamido, and arylsulfonamido comprising phenylsulfonamido or naphthylsulfonamido having a substituent group having 1 to 20 carbon atoms; R_2 represents a hydrogen atom, hydroxy amino, sulfo, alkyl having 1 to 45 carbon atoms, aryl comprising phenyl or naphthyl, or phenyl or naphthyl having a substituent group having 1 to 30 carbon atoms, alkoxy having 1 to 45 carbon atoms, aryloxy having 1 to 45 carbon atoms, alkoxycarbonyl having 1 to 40 carbons atoms, alkylamino having 1 to 45 atoms, cycloalkylamino having 3 to 8 carbon atoms and comprising cyclopentylamino, cyclohexylamino, and cycloheptylamino, cycloakylamino having 3 to 8 carbon atom: having a substituent group having 1 to 30 carbon atoms, dialkylamino wherein the alkyl 1 to 20 carbon atoms, diarylamino comprising diphenylamino or dinaphthylamino, or diphenylamino or dinaphthylamino having a substituent group having 1 to 15 carbon atoms, arylamino wherein the aryl has 6 to 45 carbon atoms, acylamino wherein the acyl has 1 to 45 carbon atoms, N-alkylacylamino wherein the acyl has 1 to 30 carbon atoms and the alkyl has 1 to 10 carbon atoms, carbamoyl having 1 to 45 carbon atoms, N-arylacylamino comprising phenyl-acylamino or naphthylacylamino, or phenylacylamino having a substituent group containing phenyl having 1 to 10 carbon atoms and wherein the acyl has 1 to 20 carbon atoms, ureido comprising ureido, N-alkylureido, N-phenylureido, N-naphthyl ureido having 1 to 45 carbon atoms and N-substituted phenyl ureido, N-substituted naphthyl ureido having 1 to 20 carbon atoms in the substituent group and and N-cycloalkyl ureido having 5 to 30 carbon atoms, diacyl amino wherein the acyl has 1 to 20 carbon atoms, and carboxy; R_3, R_4 and R_5 each represents a hydrogen atom, hydroxy, a halogen atom, amino, sulfonamido, sulfo, alkyl having 1 to 20 carbon atoms, alkoxy having 1 to 20 carbon atoms, alkoxycarbonyl having 1 to 20 carbon atoms, aralkyl having 1 to 20 carbon atoms, aryloxy comprising phenoxy or naphthoxy, or phenoxy having a substituent group having 1 to 14 carbon atoms or napthoxy having a substituent group having 1 to 10 carbon atoms, carboxy, carbamoyl having 1 to 20 carbon atoms, carbamido having 1 to 20 carbon atoms, acylamino wherein the acyl has 1 to 20 carbon atoms, alkylsulfonamido having 1 to 20 carbon atoms, arylsulfonamido comprising phenylsulfonamido or naphthylsulfonamido, or phenylsulfonamido having a substituent group having 2 to 14 carbon atoms or naphthylsulfonamido having a substituent group having 1 to **10 carbon atoms, alkylamino having** 1 to 20 caron atoms, arylamino comprising phenylamino or naphthylamino, or phenylamino having a substituent group having 1 to 14 carbon atoms or naphthylamino having a substituent group having 1 to 10 carbon atoms, or R_3 and R_4 can combine to form cyclopentane, cyclohexane, cycloheptane, benzene, benzene substituted with a halogen atom, amino, hydroxy, sulfo, carboxy, sulfonamido or alkyl, alkoxy, acylamino, alkylamino or arylamino as defined for R_2, pyridine ring, dihydrofuran ring, dihydrothiophene ring or a thiophene ring; and Y represents chlorine, bromine, iodine, perchlorate, periodate or p-toluene sulfonate.

3,956,340

PROCESS FOR THE PRODUCTION OF POLYHALOGENATED NICOTINIC ACIDS

Francis Mutterer, St. Louis, France, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 13, 1974, Ser. No. 450,933

Claims priority, application Switzerland, Apr. 4, 1973, 4797/73

Int. Cl.² C07D *213/80*

U.S. Cl. 260—295.5 R **8 Claims**

1. A process for the manufacture of 2,6-dichloronicotinic acid which comprises oxidizing 2,6-dichloro-3-chloromethylpyridine by reaction with highly concentrated nitric acid containing at least 90% by weight of HNO_3, in the presence of concentrated sulphuric acid and of a catalyst selected from the group consisting of salts of vanadium, selenium, copper and mercury, at temperatures of 100° to 160°C.

3,956,341

1,3,5-TRICARBO-1,4-DIHYDROPYRIDINES

Bernard Loev, Broomall, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Filed Feb. 21, 1974, Ser. No. 444,455

Int. Cl.² C07D *211/80*

U.S. Cl. 260—295.5 R **1 Claim**

1. The compound 1,3,5-tricarbethoxy-1,4-dihydro-2,6-dimethyl-4-(2-trifluoromethylphenyl)pyridine.

3,956,342
4-[4-(2,6-DIAMINOPYRIDYLIMINO)]-2,5-CYCLOHEXADIEN-1-ONE

Gregoire Kalopissis, Paris; Andree Bugaut, Boulogne-sur-Seine, and Francoise Estradier, Paris, all of France, assignors to L'Oreal, Paris, France

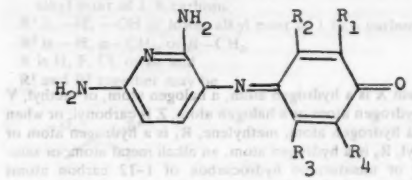
Division of Ser. No. 160,511, July 7, 1971, Pat. No. 3,838,965, which is a continuation-in-part of Ser. No. 97,395, Dec. 11, 1970, abandoned, which is a continuation-in-part of Ser. No. 45,564, June 11, 1970, abandoned. This application May 13, 1974, Ser. No. 469,497

Claims priority, application Luxemburg, July 13, 1970, 61316; June 11, 1969, 58848

Int. Cl.[2] C07D *213/74*

U.S. Cl. 260—296 R 1 Claim

1. An indoaniline having the formula



wherein R_1, R_2, R_3 and R_4, each independently represent a member selected from the group consisting of hydrogen, halogen, lower alkyl having 1–4 carbon atoms and lower alkoxy having 1 to 4 carbon atoms, and the tautomeric forms thereof.

3,956,343
NOVEL 5-VINYL-3-ISOXAZOLYL SUBSTITUTED PYRIDINES

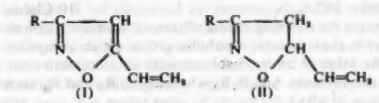
Lantz Stephen Crawley, Spring Valley, N.Y., and Sidney Robert Safir, River Edge, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Apr. 4, 1975, Ser. No. 565,285

Int. Cl.[2] C07D *213/02*

U.S. Cl. 260—296 R 9 Claims

1. A compound selected from the group consisting of those of the formulae:



wherein R is α-pyridyl, β-pyridyl, or γ-pyridyl; and the pharmacologically acceptable acid-addition salts thereof.

3,956,344
PROCESS FOR THE PRODUCTION OF SUBSTITUTED 2-BENZOYLPYRIDINES

Walter Von Bebenburg, Buchschlag, and Heribert Offermanns, Hanau, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

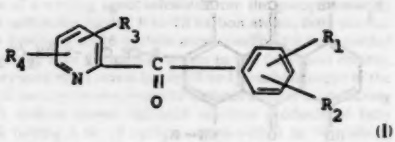
Filed Dec. 20, 1974, Ser. No. 534,866

Claims priority, application Germany, Dec. 24, 1973, 2364636

Int. Cl.[2] C07D *213/50*

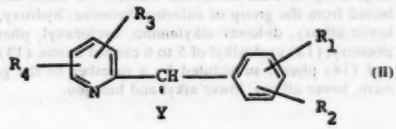
U.S. Cl. 260—297 R 27 Claims

1. In a process for the production of a 2-benzoyl pyridine of the Formula:



(I)

comprising oxidizing a compound of the Formula:



(II)

wherein each of R_1, R_2, R_3 and R_4 is hydrogen, halogen, nitro, trifluoromethyl, cyano, hydroxyl, alkyl or alkoxy and Y is cyano, carboxy or lower carbalkoxy, the improvement comprising carrying out the oxidation with a peroxide in a polar, saturated organic solvent in the presence of at least 250 ml of water per mole of compound of formula II in the presence of an alkali cyanate, alkaline earth metal cyanate or ammonium cyanate to provide cyanate ions with the proviso that when the cyanate is added simultaneously with or subsequent to the addition of the peroxide, the addition of the cyanate takes place within 70 minutes.

3,956,345
ANTHRAQUINONE DYESTUFFS WHICH ARE SPARINGLY SOLUBLE IN WATER, AND THEIR MANUFACTURE AND USE

Hans Bosshard, Basel, Switzerland; Michael Diamantoglou, Erlenbach, Germany; Hans Peter Koelliker, Muenchenstein, and Urs Karlen, Magden, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

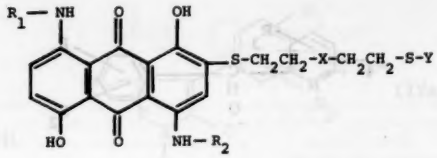
Division of Ser. No. 160,206, July 6, 1971, Pat. No. 3,819,665. This application Jan. 2, 1974, Ser. No. 429,772

Claims priority, application Switzerland, July 6, 1970, 10162/70

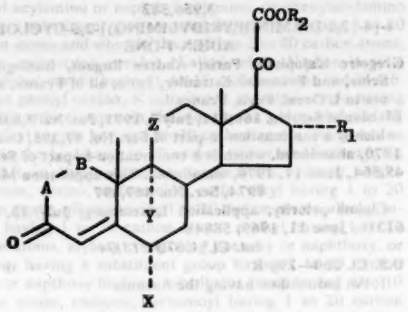
Int. Cl.[2] C09B *1/56*

U.S. Cl. 260—380 4 Claims

1. An anthraquinone dyestuff of the formula



lower alkyl, X denotes a direct bond, $-CH_2-$, $-O-$ or $-S-$, and Y denotes a member selected from the group of (1) nitrile, (2) thiocarboxylic acid o-phenyl ester, (3) thiocarboxylic acid o-lower alkyl ester, (4) lower alkanoyl, (5) chloro-lower alkanoyl, (6) bromo-lower alkanoyl, (7) lower alkoxy lower alkanoyl, (8) benzoyl, (9) alkyl of up to 4 carbon atoms, (10) alkenyl of up to 4 carbon atoms, (11) substituted alkyl of up to 4 carbon atoms wherein the substituent is selected from the group of chlorine, bromine, hydroxy, nitrile, lower alkoxy, di-lower alkylamino, cyclohexyl, phenyl and phenoxy, (12) cycloalkyl of 5 to 6 carbon atoms, (13) phenyl and (14) phenyl substituted by a member of the group of nitro, lower alkoxy, lower alkyl and halogen.



wherein X is a hydrogen atom, a halogen atom, or methyl, Y is a hydrogen atom or a halogen atom, Z is carbonyl, or when Y is a hydrogen atom, methylene, R_1 is a hydrogen atom or methyl, R_2 is a hydrogen atom, an alkali metal atom, or saturated or unsaturated hydrocarbon of 1–12 carbon atoms which is unsubstituted or substituted by up to 3 of hydroxy, halo, alkoxy, carboxy, carbalkoxy, amino, alkylamino, dialkylamino, nitro, sulfato and alkali metal salts thereof wherein each alkyl group is of 1 to 4 carbon atoms, —A—B— is —CH=CH— or —CCl=CH— or when at least one of X, Y and R_1 is other than hydrogen, $-CH_2-CH_2-$.

3,956,346

PROCESS FOR THE PREPARATION OF TRIMETHYL-BENZOQUINONE

Michel Rakoutz, Oullins, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed Jan. 17, 1975, Ser. No. 542,003

Claims priority, application France, Jan. 21, 1974, 74.01917

Int. Cl.² C07C *49/64*

U.S. Cl. 260—396 R **9 Claims**

1. Process for the preparation of trimethyl-benzoquinone which comprises oxidising 2,3,6-trimethylphenol directly with manganese dioxide in an aqueous solution containing sulphuric acid in an amount up to 40% by weight at a temperature from 10°C up to the reflux temperature of the reaction mixture, at least 1 mol of sulphuric acid being present per mol of manganese dioxide.

3,956,347

NOVEL PREGNANOIC ACID DERIVATIVES

Henry Laurent; Rudolf Wiechert; Klaus Mengel, and Hans Wendt, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

Filed Apr. 15, 1974, Ser. No. 460,905

Claims priority, application Germany, Apr. 14, 1973, 2319479; Apr. 14, 1973, 2319478; Apr. 14, 1973, 2319477

Int. Cl.² C07J *3/00*

U.S. Cl. 260—397.1 **37 Claims**

1. A pregnanoic acid derivative of the formula

3,956,348

STEROID ETHER SPLITTING

Jean-Claude Hilscher, Berlin, Germany, assignor to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

Filed Feb. 25, 1975, Ser. No. 552,960

Claims priority, application Germany, Feb. 27, 1974, 2409991

Int. Cl.² C07J *1/00*

U.S. Cl. 260—397.5 **10 Claims**

1. A process for cleaving ethers of steroid aromatic alcohols to regenerate the aromatic alcoholic group which comprises reacting the ether in an inert solvent with an aluminum compound of the formula $AlR_1R_2R_3$ wherein R_1, R_2 and R_3 each are hydrogen or alkyl.

3,956,349

PROCESS FOR PREPARING 3-ENOL ETHERS OF 11β-HYDROXY-Δ⁴-PREGNENE-3-ONES AND DERIVATIVES THEREOF

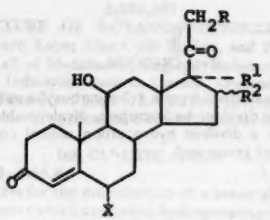
Pasquale G. Gallegra, San Jose, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Feb. 18, 1975, Ser. No. 550,245

Int. Cl.² C07J *71/00*

U.S. Cl. 260—397.45 **18 Claims**

1. A process which comprises reacting a compound chosen from the group represented by the formula



wherein

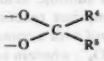
R is —H, —OH, lower alkyl ether of 1–6 carbons, or lower alkyl ester of 1–6 carbons;

R^1 is —H, —OH or lower alkyl ester of 1 to 6 carbons;

R^2 is —H, α—CH_3, or β—CH_3;

X is H, F, Cl, or Br and

R^1 and R^2 together may be



with triethyl orthoacetate in the presence of a catalytic amount of a strong acid in a solvent which consists essentially of about 40% by weight or more ethanol and about 60% by weight or less of a compatible, oxygenated hydrocarbon liquid.

3,956,350

PROCESS FOR THE PRODUCTION OF TEXTILE SOFTENERS

Günter Pusch, Leitershofen; Heinrich Singer, Horgau, both of Germany, and Jutta Ibrahim, Allschwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 8, 1974, Ser. No. 458,923

Claims priority, application Germany, Apr. 14, 1973, 2318906; Jan. 18, 1974, 2402258

Int. Cl.² C07C *103/12, 103/127, 103/133*

U.S. Cl. 260—404.5 **4 Claims**

1. A process for the production of textile softeners, comprising the steps of condensing with stirring and heating an aliphatic monobasic fatty acid of at least 8 carbon atoms or mixture of said acids, provided that the fatty acid be at least 40 mole % of saturated or monounsaturated straight-chain fatty acid with at least 12 carbon atoms, with diethylene triamine, dipropylene triamine or mixtures thereof in a molar ratio of fatty acid to triamine of about 2:1 to form a bis-amide, heating the resulting fatty acid amine condensation product with urea in a molar ratio of about 1:0.5 to 1:1 so that 0.5 to 1 mole of ammonia per mole of fatty acid amine condensation product is given off, and finally, treating the resulting urea condensation product with 1 to 5 moles of formaldehyde per mole of urea to methylolate the urea condensation product.

3,956,351

PROCESS FOR SEPARATING FATTY MIXTURES

Werner Stein, Erkrath-Unterbach, and Richard Schuh, Hannover, both of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf, Germany

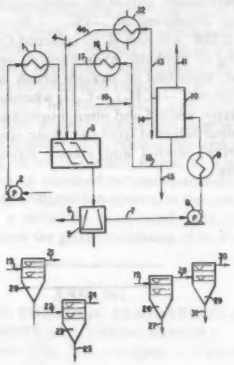
Filed Apr. 30, 1974, Ser. No. 465,528

Claims priority, application Austria, May 9, 1973, 4067/73

Int. Cl.² C09F *5/10;* **C11B** *3/00;* **C11C** *1/08*

U.S. Cl. 260—419 **12 Claims**

1. In the method for separating a mixture of solid and liquid fatty acids by the rewetting process which comprises the steps of (a) transforming said mixture into a dispersion of liquid fatty acid particles and solid fatty acid particles in an aqueous solution of a wetting agent selected from the group consisting of alkyl sulfonates having 8 to 18 carbon atoms, fatty alcohol sulfates having 8 to 18 carbon atoms, sulfofatty acid methyl esters having 8 to 18 carbon atoms in the fatty acid moiety, sulfofatty acid ethyl esters having 8 to 18 carbon atoms in the fatty acid moiety, monoglyceride sulfates of fatty acids having 8 to 18 carbon atoms, sulfated reaction products of fatty alcohols having 8 to 18 carbon atoms with 1 to 10 mols of ethylene oxide and/or propylene oxide, and mixtures thereof; (b) separating said dispersion into two phases of different specific gravity, of which the lighter phase consists substantially of the liquid fatty acid and the heavier phase consists substantially of a dispersion of the solid fatty acid in an aqueous wetting agent solution, (c) separating said solid fatty acid particles from said aqueous wetting agent solution in said suspension, (d) removing at least a part of said aqueous wetting agent solution and replacing the part removed by a liquid selected from the group consisting of water and an aqueous



solution containing a substance selected from the group consisting of the aforementioned wetting agents, an electrolyte and mixtures thereof, (e) recycling to step (a) at least a portion of the wetting agent solution that has not been removed from the process, and (f) recovering said liquid and said solid fatty acids, the improvement which comprises heating said suspension of solid fatty acid particles in said aqueous wetting agent solution of (b) separated from said liquid fatty substance to a temperature between the melting point of said solid fatty substance up to about 85° C in a separation zone under ordinary or increased gravity to produce a three-phase system which consists of a molten fatty acid portion as the lightest phase, an intermediate aqueous phase of median specific gravity with a high concentration of wetting agent, and a heavy aqueous phase with a low concentration of wetting agent, and substantially separating said molten fatty acid portion and separating said other two phases from each other, and recycling at least part of said intermediate aqueous phase.

3,956,352

HETEROCYCLIC ALUMINUM COMPOUNDS AND PROCESS FOR THEIR PREPARATION

Claude Bouillon, Eaubonne; Pierre Dufaure, Paris, and Georges Rosenbaum, Asnieres, all of France, assignors to L'Oreal, Paris, France

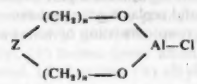
Filed Dec. 28, 1973, Ser. No. 429,070

Claims priority, application Luxemburg, Jan. 2, 1973, 66783

Int. Cl.² C07F 5/06

U.S. Cl. 260—448 AD 5 Claims

1. A compound of the formula



(I)

wherein:

n is 1 or 2, and

a. when *n* = 1, Z is —CH=CH–; and

b. when *n* = 2, Z is selected from the group consisting of

i. $-(CH_2)_m$ wherein *m* is 0–6, and

ii. a heteroatom, optionally substituted, selected from the group consisting of —O—, —S—, >SO, $>SO_2$ and >N-COR′ wherein R′ is selected from the group consisting of aliphatic hydrocarbon, saturated or unsaturated, branched or straight chain, having 1 to 17 carbon atoms, $-(CH_2)_q-C_6H_5$ wherein *q* is 0 or 1, styryl, diphenyl methyl and phenyl optionally substituted by a member selected from the group consisting of chlorine, fluorine, methyl and alkoxy having 1 to 4 carbon atoms.

3,956,353

ANIONIC COUPLING AGENTS

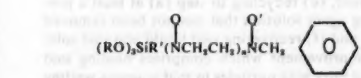
Edwin P. Plueddemann, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed July 15, 1974, Ser. No. 488,365

Int. Cl. C07f 7/10, 7/18

U.S. Cl. 260—448.8 R 8 Claims

1. A composition of matter of the formula



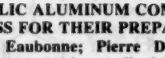
in which

R is a lower alkyl or lower alkoxyalkyl radical,

R′ is an alkylene radical of 1 to 6 carbon atoms,

Q and Q′ are lower alkyl, hydrogen or the group

at least one Q or Q′ being the latter group,



group being derived from a 1,2-dicarboxylic anhydride,

R″ being divalent hydrocarbon, divalent chlorohydrocarbon or a divalent hydrocarbon radical containing one carboxyl group and

n is 0 or 1.

3,956,354

METHOD FOR THE PREPARATION OF SULFONIC ACID ESTERS FROM FREE SULFONIC ACIDS

Calvin William Schroeck, Eastlake, Ohio, assignor to The Lubrizol Corporation, Cleveland, Ohio

Filed May 7, 1973, Ser. No. 358,213

Int. Cl.² C07C 139/00

U.S. Cl. 260—456 A 6 Claims

1. A method for the preparation of a sulfonic acid ester containing the moiety $-SO_3R^1$ which comprises reacting the corresponding sulfonic acid or a salt thereof with a compound having the formula $R^1O\text{-}CH{=}N^+(R^3)_3R^1SO_4^-$, wherein each of R^1 and R^3 is a lower alkyl radical.

3,956,355

METHOD FOR MANUFACTURING CYANONORBORNENE

Takashi Ueshima, Yokohama; Tosiro Yokoyama, Kawasaki, and Shoichi Kobayashi, Yokohama, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 3, 1975, Ser. No. 564,819

Claims priority, application Japan, Apr. 9, 1974, 49-39454

Int. Cl.² C07C 120/00, 121/48

U.S. Cl. 260—464 16 Claims

1. A method for manufacturing cyanonorbornene which comprises reacting acrylonitrile with a C_5 fraction resulting from cracking a petroleum fraction consisting essentially of a mixture of hydrocarbons predominately of 5-carbon atom hydrocarbons comprising at least 5% by weight of cyclopentadiene, said C_5 fraction having a boiling point between about 15 to 55°C, at a temperature between about 0 and 150°C, with the molar ratio of acrylonitrile to cyclopentadiene contained in said C_5 fraction being between about 0.3:1 and 3:1.

3,956,356

CONVERSION OF LACTAMS TO ALKENENITRILES

Raymond L. Cobb, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 7, 1970, Ser. No. 78,753

Int. Cl.² C07C 120/10

U.S. Cl. 260—465.2 4 Claims

1. A process for the production of alkenenitriles from the polymer byproduct resulting from the ammonolysis of one or more lactams to form the corresponding alpha,omega-aminonitrile which comprises treating said polymer byproduct with ammonia in a reaction zone in the presence of a gamma-alumina catalyst at a temperature in the range of 300° to 700° C. and at a pressure in the range of 0 to 2000 psig whereby said polymer byproduct is converted to the corresponding alkenenitrile and thereafter recovering the resulting alkenenitrile as a product of the process.

3,956,357

MANUFACTURE OF 2-CYANO-PROPIONATE ESTERS

Albert Edward Kaye; Alan Cyril Tucker, and Ronald James Hurlock, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Mar. 13, 1975, Ser. No. 557,902
Claims priority, application United Kingdom, Apr. 26, 1974, 18372/74
Int. Cl.² C07C 120/00
U.S. Cl. 260—465.4 10 Claims

1. A process for the manufacture of a lower alkyl 2-cyanopropionate ester which comprises hydrogenating at a temperature of 15° to 80°C and in the presence of a hydrogenation catalyst, a reaction mixture of a cyano-acetic lower alkyl ester, formaldehyde and a condensation catalyst suitable for reacting formaldehyde with active methylene groups, and recovering the lower alkyl 2-cyanopropionate thus produced, hydrogen being introduced to the reaction mixture before the formaldehyde is added thereto and the hydrogenation catalyst being selected from the group consisting of palladium, platinum, rhodium, cobalt, ruthenium and Raney nickel.

3,956,358

DIMERIZATION METHOD

Olav Torgeir Onsager, Suffern, N.Y., assignor to Halcon International, Inc., New York, N.Y.

Filed Dec. 30, 1974, Ser. No. 537,297
Int. Cl.² C07C 120/00, 69/52
U.S. Cl. 260—465.8 D 6 Claims

1. A process for the dimerization of an α,β-unsaturated carboxylic acid derivative which is acrylonitrile or a lower alkyl or phenyl ester of acrylic acid to produce 2-methylene glutaronitrile or a lower alkyl or phenyl ester of 2-methylene glutaric acid which comprises reacting said derivative in the liquid phase at a temperature of 10° to 150°C. in the presence of a catalyst consisting essentially of (a) at least one metal compound of the formula $M(X)_n$ wherein M is zinc, aluminum, titanium, vanadium, iron, or cobalt, X is a halide and n is a number equal to the valence of the metal M; and (b) at least one nitrogen-containing Lewis Base which is (1) a tertiary monoaryl amine of the formula

wherein R^1 and R^2 are the same or different and each is an alkyl group or a cycloalkyl group with at least one of R^1 and R^2 containing at least two carbon atoms; or (2) a tertiary monobenzyl amine of the formula

wherein R^3 and R^4 are the same or different and each is an alkyl or cycloalkyl radical; or (3) a tertiary poly-functional amine wich contains at least two Lewis Base nitrogen groups which are separated from each other by at least one carbon atom, and are (a) N-substituted amino groups wherein each N-substituent is the same or different and is an alkyl, cycloalkyl, benzyl, aryl radical or (b) N-heterocyclyc groups containing 3 to 20 carbon atoms; or (4) a mono nitrogen-containing N-substituted heterocyclic amine wherein the N-substituent is an alkyl, benzyl, cycloalkyl or aryl radical, wherein the Lewis Base/metal compound mole ratio is from 0.1:1 to 25:1, each radical and each heterocyclic group or ring may be unsubstituted or substituted by non-reactive groups, each alkyl radical contains 1 to 20 carbon atoms and each aryl radical contains 6 to 20 carbon atoms.

3,956,359

ALKYLIDENEDITHIOBISPHENOLS

Martin B. Neuworth, Trumbull, Conn., assignor to Continental Oil Company, Ponca City, Okla.

Division of Ser. No. 367,055, May 29, 1973, Pat. No. 3,897,500, which is a division of Ser. No. 206,929, Dec. 10, 1971, Pat. No. 3,786,100, which is a division of Ser. No. 835,811, June 23, 1969, abandoned, which is a continuation-in-part of Ser. Nos. 637,622, May 11, 1967, abandoned, and Ser. No. 637,649, May 11, 1967, abandoned, and Ser. No. 637,650, May 11, 1967, abandoned. This application Nov. 20, 1974, Ser. No. 525,330
Int. Cl.² C07C 149/40
U.S. Cl. 260—470 2 Claims

1. Acetoacetic Acid:3-Thio, ethyl ester-Bis-(3,5-di-t-butyl-4-hydroxyphenyl)-mercaptal.

3,956,360

PROCESS FOR THE MANUFACTURE OF URETHANES

John G. Zajacek, Strafford; John J. McCoy, Media, both of Pa., and Karl E. Fuger, Therwil, Switzerland, assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 372,458, June 21, 1973, Pat. No. 3,895,054, which is a continuation-in-part of Ser. No. 284,872, Aug. 30, 1972, abandoned. This application Apr. 11, 1974, Ser. No. 459,998
Int. Cl.² C07C 125/06
U.S. Cl. 260—471 C 9 Claims

1. A process for the manufacture of urethanes by reacting at least one hydroxyl group containing compound having the formula $R(OH)_n$ or $R'(OH)_n$ wherein n is from 1 to 3, R is an optionally substituted aliphatic, cycloaliphatic or araliphatic group having from 1 to 20 carbon atoms, and R' is an aromatic group containing 1 to 3 benzenoid rings with carbon monoxide and a nitrogenous organic compound selected from the group consisting of organic nitro, nitroso, azo and azoxy compounds containing up to 24 carbon atoms, at a superatmospheric pressure and an elevated temperature below the temperature at which decomposition occurs, in the presence of an active amount of a tellurium compound, and at least one member selected from the group consisting of base and water.

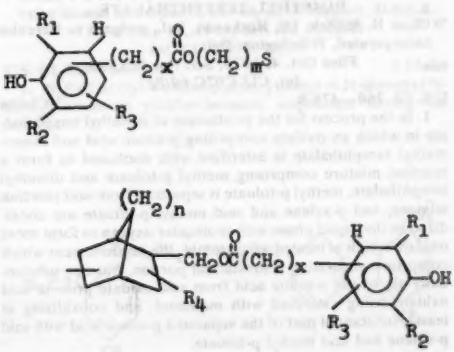
3,956,361

HINDERED PHENOLIC DERIVATIVES OF NORBORNANE THIOALCOHOLS

John F. Stephen, New City, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 23, 1974, Ser. No. 472,558
Int. Cl.² C07C 69/76
U.S. Cl. 260—473 S 11 Claims

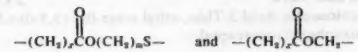
1. A compound having the formula I



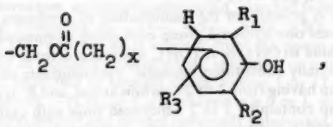
wherein

R_1 and R_2 are independently the same or different alkyl groups of from 1 to 8 carbon atoms, cycloalkyl of from 5 to 6 carbon atoms or one of R_1 and R_2 is hydrogen,

R_3 is hydrogen or lower alkyl of from 1 to 6 carbon atoms, providing that R_3 may be in either the meta or para position of the aromatic ring relevant to the hydroxyl group and that the side chain groups



are located on the carbon adjacent to that of the R_3 group, R_4 is hydrogen or a group



m has a value of 2 to 6,
n has a value of 0 to 2, and
x has a value of 1 to 2.

3,956,362

COOXIDATION PROCESS FOR THE PRODUCTION OF DIMETHYL TEREPHTHALATE

William H. Millick, III, Hockessin, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Oct. 4, 1973, Ser. No. 403,582
Int. Cl.² C07C *69/82*
U.S. Cl. 260—475 R **7 Claims**

1. In the process for the production of dimethyl terephthalate in which an oxidate comprising p-toluic acid and monomethyl terephthalate is esterified with methanol to form a reaction mixture comprising methyl p-toluate and dimethyl terephthalate, methyl p-toluate is separated from said reaction mixture, and p-xylene and said methyl p-toluate are cooxidized in the liquid phase with molecular oxygen to form more oxidate which is treated as aforesaid, the improvement which comprises: separating a substantial portion, but not substantially all, of the p-toluic acid from said oxidate prior to said oxidate being esterified with methanol, and cooxidizing at least a substantial part of the separated p-toluic acid with said p-xylene and said methyl p-toluate.

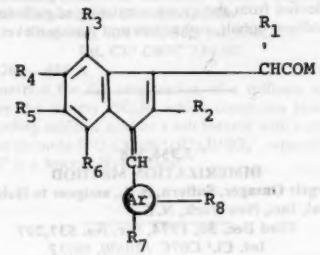
3,956,363

SUBSTITUTED INDENYL ACETIC ACIDS

Tsung-Ying Shen, Westfield, N.J.; Richard B. Greenwald, Framingham, Mass.; Howard Jones, Holmdel, N.J.; Bruce O. Linn, Somerville, N.J., and Bruce E. Witzel, Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 478,548, June 11, 1974, Pat. No. 3,888,902, which is a continuation of Ser. No. 301,914, Oct. 30, 1972, abandoned, which is a division of Ser. No. 187,197, Oct. 6, 1971, Pat. No. 3,725,548, which is a division of Ser. No. 33,981, May 1, 1970, Pat. No. 3,654,349, which is a continuation-in-part of Ser. No. 848,736, Aug., 1969, abandoned. This application Aug. 23, 1974, Ser. No. 499,870
Int. Cl.² C07C *63/50*
U.S. Cl. 260—479 R **5 Claims**

1. A compound of the formula



wherein:

Ar is phenyl;

R_1 is hydrogen, C_{1-5} loweralkyl or halogenated C_{1-5} loweralkyl;

R_2 is hydrogen or C_{1-5} loweralkyl;

R_3, R_4, R_5 and R_6 are each hydrogen, C_{1-5} loweralkyl, C_{1-5} loweralkanoyloxy, benzyloxy, C_{1-5} loweralkoxy, nitro, amino, C_{1-5} loweralkanoylamino, benzoylamino, C_{1-5} loweralkylamino, di-C_{1-5} loweralkylamino, di-C_{1-5} loweralkylaminoalkyl, sulfamyl, C_{1-5} loweralkylthio, mercapto, halogen, hydroxy, hydroxy C_{1-5} loweralkyl, C_{1-5} loweralkylsulfonyl, carboxyl, carb C_{1-5} loweralkoxy, carbamido, halogeno C_{1-5} loweralkyl, at least one of R_3-R_6 being C_{1-5} loweralkanoyloxy, benzoyloxy, C_{1-5} loweralkanoylamino or benzoylamino;

R_7 may be C_{1-5} loweralkyl or C_{1-5} loweralkylsulfonyl;

R_8 may be hydrogen, halogen, hydroxy, C_{1-5} loweralkoxy or halo C_{1-5} loweralkyl; and

M may be hydroxy, C_{1-5} loweralkoxy and the pharmaceutically acceptable acid salts.

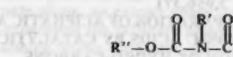
3,956,364

NEMATOCIDAL N-CYANOFORMYL CARBAMATES

Malcolm S. Singer, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 280,608, Aug. 14, 1972, Pat. No. 3,845,091. This application May 15, 1974, Ser. No. 470,234
Int. Cl.² C07C *125/06*
U.S. Cl. 260—479 C **6 Claims**

1. A compound of formula



wherein R′ is alkyl of 1 to 6 carbon atoms and R″ is alkyl of 1 to 10 carbon atoms, alkenyl of 2 to 10 carbon atoms, cycloalkyl of 3 to 10 carbon atoms, biphenyl, phenyl, hydrocarbon aralkyl of 7 to 10 carbon atoms, or phenyl substituted with from 1 to 3 groups selected from fluorine, chlorine, bromine and alkyl of 1 to 6 carbon atoms.

3,956,365

HALOALKYL-CARBAMOXYALKYL DERIVATIVES

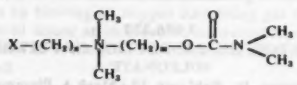
Harold Z. Sommer, Havre de Grace, and Jacob I. Miller, Baltimore, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 574,497, Aug. 18, 1966. This application Feb. 28, 1967, Ser. No. 619,481

Int. Cl.² C07C *125/06*

U.S. Cl. 260—482 C **3 Claims**

1. Compounds having the formula:



where *m* is 2 to 6, *n* is 6 to 16, and where X is a halogen selected from the group consisting of chlorine, bromine, and iodine.

2. 10-bromodecyl(2-dimethylcarbamoxyethyl)dimethylammonium bromide.

3. 10-bromodecyl(3-dimethylcarbamoxypropyl)dimethylammonium bromide.

3,956,366

N-MONOHALOMONOSUBSTITUTED UREAS

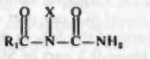
Chester Stephen Sheppard, Tonawanda, and Leonard Earnest Korczykowski, North Tonawanda, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 684,651, Nov. 21, 1967, Pat. No. 3,746,760, which is a continuation-in-part of Ser. No. 409,306, Nov. 5, 1964, abandoned. This application June 28, 1973, Ser. No. 374,445

Int. Cl.² C07C *125/06*

U.S. Cl. 260—482 C **6 Claims**

1. N-monohalomonosubstituted urea of the formula



where: X is chlorine or bromine; and R_1 is alkoxy or aryloxy of up to 10 carbon atoms.

3,956,367

3-FLUORO-D-ALANINE AND PHARMACOLOGICALLY ACCEPTABLE ESTERS, AND PHARMACOLOGICALLY ACCEPTABLE SALTS THEREOF

Janos Kollonitsch, Westfield, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 223,354, Feb. 3, 1972, and a continuation-in-part of Ser. No. 245,288, April 18, 1972, Pat. No. 3,839,170, which is a continuation of Ser. No. 60,645, Aug. 3, 1970, abandoned. This application Aug. 5, 1974, Ser. No. 494,945

Int. Cl.² C07C *101/10, 101/18, 101/19*

U.S. Cl. 260—482 R **8 Claims**

1. A compound selected from the group consisting of 3-fluoro-D-alanine substantially free of the L-form, and its pharmacologically acceptable lower alkyl, pivaloyloxymethyl, benzyl, cyclohexyl and cyclopentyl esters; and pharmacologically acceptable salts thereof.

3,956,368

PROCESS FOR THE PRODUCTION OF GUANIDINE SALTS OF ALIPHATIC MERCAPTOSULPHONIC ACIDS

Helmut Hoffmann, Cologne, and Carlhans Suling, Odenthal-Hahnenberg, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

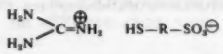
Filed June 14, 1974, Ser. No. 479,440

Claims priority, application Germany, June 16, 1973, 2330817

Int. Cl.² C07C *129/00*

U.S. Cl. 260—501.14 **2 Claims**

1. A process for the production of a guanidinium salt of an alkyl mercaptosulphonic acid of the general formula:



in which R represents $-CH_2CH_2-$ in a high yield and with improved purity, which comprises reacting an S-isothiuronium betain with ammonia said reacting being effected by introducing gaseous ammonia into a suspension of said S-isothiuronium betain in an saturated aliphatic alcohol having 1 to 4 carbon atoms and which is inert with respect to ammonia, at a temperature in the range from 50° to 85°C.

3,956,369

N-β-(2-ACETYL-4-CHLOROPHENOXY)-ETHYL-N,N-DIMETHYL-N-BENZYL-AMMONIUM-P-CHLOROBENZENE SULPHONATE, METHOI FOR PREPARING SAME AND MEDICINAL PREPARATION BASED THEREON

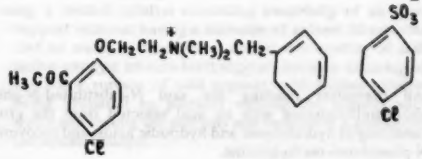
Natalia Nikolaevna Ozeretskovskaya, Lomonosovsky prospekt 14, kv. 184; Vladimir Kuzmich Karnaukhov, Zhivopisnaya ulitsa 34/14, kv. 7; Alexandr Markusovich Bronshtein, Glinisty pereulok 12, kv. 17; Vera Fedorovna Gladkikh, ulitsa Ostuzheva 19/6, kv. 18; Marina Nikolaevna Lebedeva, ulitsa Obrucheva, 9, kv. 83; Elvira Vasilievna Sazonova, Festivalnaya ulitsa, 11, kv. 59; Nelli Dmitrievna Lychko, 3 Frunzenskaya ulitsa, 26, kv. 55; Andrei Ivanovich Krotov, Profsojuznaya ulitsa 102, korpus 5, kv. 109; Olga Evgenievna Kuznetsova, Vinnitskaya ulitsa, 5, kv. 12; Alla Fedorovna Bekhli, Rostovskaya Naberezhnaya 3, kv. 32; Maria Borisovna Braude, Festivalnaya ulitsa 7, kv. 18; Ljubov Alexeevna Bolotina, Novokhoroshevskoe shosse, korpus 1, dom 8, kv. 72; Renata Leonidovna Polovinchik, ulitsa Nizhnyaya Maslovka, 14, kv. 67, and Boris Alexandrovich Astafiev, Otkrytoe shosse, 6, korpus 7, kv. 44, all of Moscow, U.S.S.R.

Filed May 18, 1973, Ser. No. 361,847

Int. Cl.² C07C *93/14*

U.S. Cl. 260—501.15 **1 Claim**

1. N-β-(2-acetyl-4-chlorophenoxy)-ethyl-N,N-dimethyl-N-benzylammonium p-chlorobenzene sulphonate having the formula



3,956,370

PREPARATION OF N-PHOSPHONOMETHYLGLYCINE

David Rees Parry, Wokingham, and Clive Dudley Spencer Tomlin, Crowthorne, both of England, assignors to Imperial Chemical Industries Limited, London, England

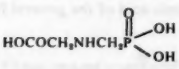
Filed July 2, 1973, Ser. No. 375,912

Claims priority, application United Kingdom, July 21, 1972, 34204/72

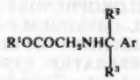
Int. Cl.² C07F 9/38

U.S. Cl. 260—502.5 3 Claims

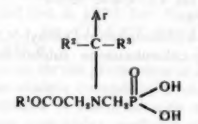
1. A process of preparing N-phosphonomethyl-glycine having the formula:



which comprises reacting an N-substituted glycine derivative of the formula:



wherein R^1 is a hydrogen atom or an esterifying group, Ar is an aryl radical, and R^2 and R^3 are each selected from the group consisting of hydrogen atoms and aryl radicals, with formaldehyde and phosphorous acid in a nonoxidizing acidic aqueous medium to give an N-substituted-N-phosphonomethylglycine derivative of the formula:



and thereafter reacting the said N-substituted-N-phosphonomethylglycine with an acid selected from the group consisting of hydrobromic and hydriodic acids, and recovering N-phosphono-methylglycine.

3,956,371

METHOD FOR THE PREPARATION OF ALIPHATIC AND ALICYCLIC SULPHONIC ACIDS BY CATALYTIC SULPHOXIDATION OF HYDRO-CARBONS

Bengt G. Bjellqvist, Vasterhaninge; Torbjörn E. G. Westermark, Taby; Anders R. Axelsson, Stockholm, and Martin J. Nilsson, Molndal, all of Sweden, assignors to Aminkemi AB, Bromma, Sweden

Continuation-in-part of Ser. No. 885,975, Dec. 17, 1969, abandoned. This application Sept. 13, 1972, Ser. No. 288,832

Claims priority, application Sweden, Dec. 20, 1968, 17533/68

Int. Cl.² C07C 143/00

U.S. Cl. 260—503 24 Claims

1. In the known process for the preparation of saturated, non-branched alkyl or cycloalkyl sulphonic acids containing from 6 to 30 carbon atoms inclusive by reacting the corresponding alkane or cycloalkane with sulphur dioxide and elementary oxygen in the presence of a catalyst, the improvement which comprises using copper as the catalyst, the copper being added in the form of copper metal, an oxide or a salt, the salt being the salt of an inorganic or an organic acid and either dissolved or dispersed in the alkane or cycloalkane.

3,956,372

PROCESS FOR THE PRODUCTION OF PETROLEUM SULFONATE

John R. Coleman, Jr., Robinson, Ill.; Mark A. Plummer; Carle C. Zimmerman, Jr., both of Littleton, Colo.; Henry J. Pietrzak, Texas City, Tex.; Wayne E. Luetzelschwab, Littleton, Colo.; Kent W. Robinson, Englewood, Colo., and Donald E. Schroeder, Jr., Littleton, Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Nov. 2, 1973, Ser. No. 412,062

Int. Cl.² C07C 143/24

U.S. Cl. 260—505 S 25 Claims

1. A process for producing monovalent cation-containing petroleum sulfonates which are capable of forming a micellar dispersion when admixed with mixtures of hydrocarbon and aqueous medium, the process comprising reacting in a backmix tubular reactor comprised of a pump, a reaction zone and heat exchanger:

1. a hydrocarbon gas oil feedstock having an average molecular weight of about 250 to about 700 and an aliphatic to aromatic proton ratio of about 5 to about 50 moles per mole, and wherein at least about 30% of the feedstock molecules contain an aromatic nucleus, the aliphatic to aromatic proton ratio of the feedstock molecules containing the aromatic nucleus being about 3 to about 20 moles per mole,
2. with an ethylene dichloride (EDC) solution containing about 0.1 to about 0.3 part of liquid SO_3 per part of the EDC and wherein the weight ratio of the SO_3 to the gas oil feedstock is about 0.05 to about 0.3 part of SO_3 per part of gas oil feedstock, and wherein the hydrocarbon gas oil feedstock plus recycled reaction products stream is under turbulent flow and the SO_3/EDC stream is under turbulent flow, but wherein the velocity ratio of the hydrocarbon gas oil feedstock plus recycled reaction products stream to the SO_3/EDC stream is at least 4:1, respectively,
3. withdrawing about 1 part of the reaction products resulting from reaction of 1 and 2 for about 1 to about 6 parts of the reaction products recycled in the reactor, and neutralizing this portion of the reaction products to a pH of about 5 to about 9 with an aqueous basic solution containing a monovalent cation,
4. removing substantially all of the EDC from the neutralized reaction products to obtain an unextracted sulfonate mix,
5. contacting the unextracted sulfonate mix with sufficient amounts of an aqueous alcohol solution containing an alcohol which has sufficient solubility in the mixture to

cause the resulting mixture to settle into at least a raffinate phase, an extract phase, and a brine phase.

6. separating the raffinate phase, the raffinate phase containing mostly unreacted gas oil, alcohol and water,
7. separating the brine phase, and
8. separating the extract phase, the extract phase containing alcohol, water, and the petroleum sulfonate product, and removing a major portion of the alcohol and water from the extract phase to obtain the desired monovalent-containing petroleum sulfonates.

3,956,373

PROCESS FOR SULFURIC ACID PURIFICATION

James O. Knobloch, Naperville, Ill., assignor to Standard Oil Company, Chicago, Ill.

Filed Aug. 20, 1973, Ser. No. 389,960
Int. Cl.² C07C *51/44*
U.S. Cl. 260—515 A **9 Claims**

5. In the process of producing 2,5-dibromoterephthalic acid by reacting substantially equal molar quantities of terephthalic acid and bromine in an oleum medium, the improvement which comprises reducing the bromine content of the spent sulfuric acid bromination liquor containing aromatic carboxylic acids by blowing an oxygen containing gas through said sulfuric acid liquor at an elevated temperature at least until substantially all of the aromatic carboxylic acids in said liquor is oxidized.

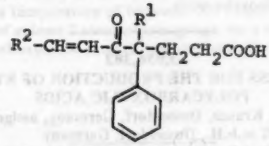
3,956,374

ARYL-OXO-HEPTENOIC ACIDS

Kenneth L. Shepard, Ambler; Edward J. Cragoe, Jr., Lansdale, and Wasyl Halczenko, Hatfield, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 3, 1974, Ser. No. 466,667
Int. Cl.² C07C *63/00*
U.S. Cl. 260—515 A **8 Claims**

1. The compound having the formula



wherein R^1 is benzyl or cinnamyl, which may be substituted with 1 or 2 substituents selected from halo, dihalo, loweralkyl, diloweralkyl, loweralkoxy, or dilower-alkoxy; and R^2 is phenyl, or phenyl substituted with 1 or 2 substituents, selected from lower-alkyl, dilower-alkyl, loweralkoxy, or diloweralkoxy.

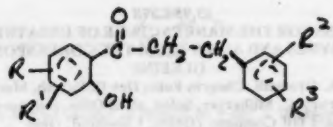
3,956,375

1,3-DIPHENYL-PROPANONE-1-DERIVATIVES AND THE SALTS THEREOF

Loránt Farkas; Mihály Nógrádi; Ágnes Gottsegen, and Sándor Antus, all of Budapest, Hungary, assignors to Chinoin Gyogyszer-es Vegyeszeti Termekek Gyara RT, Budapest, Hungary

Filed Dec. 4, 1972, Ser. No. 311,666
Claims priority, application Hungary, Dec. 20, 1972, CI-1196
Int. Cl.² C07C *65/20*
U.S. Cl. 260—520 C **6 Claims**

1. A compound of the formula:



wherein R is methoxy substituted by carboxy, R^1 is hydrogen, and R^2 and R^3 stand for hydroxy and alkoxy, respectively.

3,956,376

PROCESS FOR THE PRODUCTION OF ACROLEIN AND ACRYLIC ACID

Natale Ferlazzo, Milan; Gian Fausto Buzzi, Arona, and Marcello Ghirga, Bresso, all of Italy, assignors to Societa Italiana Resine S.p.A., Milan, Italy

Filed Nov. 29, 1973, Ser. No. 420,344
Claims priority, application Italy, Nov. 30, 1972, 32281/72
Int. Cl.² C07C *47/22, 51/26*
U.S. Cl. 260—530 N **8 Claims**

1. A process for the production of acrolein from propylene and acrylic acid from propylene or from acrolein or from mixtures of propylene and acrolein by reacting a gaseous mixture containing the said reactants and oxygen or a gas containing molecular oxygen in the presence of an oxidation catalyst consisting of combinations of cobalt, molybdenum, arsenic, tin, tellurium, manganese, nickel, bismith, phosphorus, boron, iron, vanadium, rhenium, tungsten, zinc, and antimony, either as oxides or as compounds consisting of at least two of the metals mentioned and oxygen, characterized in that the said gaseous mixture contains methanol in a quantity of from 0.01 to 1% by volume with respect to the total gaseous mixture.

3,956,377

PRODUCTION OF UNSATURATED ACIDS FROM THE CORRESPONDING ALDEHYDES

Serge R. Dolhyj, Parma, and Ernest C. Milberger, Solon, both of Ohio, assignors to The Standard Oil Company (Ohio), Cleveland, Ohio

Filed June 17, 1974, Ser. No. 479,724
Int. Cl.² C07C *51/26*
U.S. Cl. 260—530 N **9 Claims**

1. In the process for the preparation of acrylic acid or methacrylic acid by the oxidation of acrolein or methacrolein in the presence of an oxide or oxide complex active catalyst of the formula

$$A_a W_b V_c Mo_d O_x$$

wherein

A is Fe, Mn, Cu, Sn, Sb, Cr, Ce, U, Co, Ni, Zn, Mg or mixture thereof; and

wherein

a is 0–12;
b is about 0.1 to about 16;
c is about 0.5 to about 12;
d is about 8 to about 16;
x is the number of oxygens required to satisfy the valence requirements of the other elements present,

at an elevated temperature of about 200° to about 500°C., the improvement comprising

using a coated catalyst consisting essentially of an inert support material having a diameter of at least 20 microns and an outer surface and a continuous coating of said active catalyst on said inert support strongly adhering to the outer surface of said support, said coated catalyst being prepared by partially wetting the support with water and rolling the partially wet support in a powder of the active catalyst.

3,956,378

PROCESS FOR THE MANUFACTURE OF UNSATURATED ALDEHYDES AND ACIDS FROM THE CORRESPONDING OLEFINS

Robert K. Grasselli, Chagrin Falls; Dev D. Suresh, Macedonia, and Ernest C. Milberger, Solon, all of Ohio, assignors to The Standard Oil Company (Ohio), Cleveland, Ohio

Division of Ser. No. 224,967, Feb. 9, 1972, Pat. No. 3,892,794.
This application Aug. 20, 1973, Ser. No. 390,094
Int. Cl.² C07C 51/32
U.S. Cl. 260—533 N 3 Claims

1. A process for the oxidation of propylene and isobutylene to form the corresponding unsaturated aldehydes and unsaturated acids comprising contacting in the vapor phase at a temperature within the range of from about 250° to about 600°C. a mixture of a molecular oxygen-containing gas and either propylene or isobutylene, or mixtures thereof, in a molar ratio of oxygen to olefin within the range from about 0.5 to 10, in the presence of a promoted, reduced, antimony oxide-molybdenum oxide-containing catalyst wherein the catalyst is prepared by combining the following components in any order:

a. an aqueous slurry of molybdenum trioxide;
b. a reducing agent selected from the group consisting of finely divided metal, sulfur, sulfur dioxide, hydrogen sulfide, hydrazine hydrate, ammonia, hydroxylamine and an organic reducing agent capable of reducing at least some of the molybdenum to a valence state below +6 in a ratio of from about 0.0001 to 0.2 moles of the reducing agent per mole of molybdenum;
c. antimony oxide in a ratio of from about 0.1 to 9 moles of antimony oxide per mole of molybdenum; and
d. at least one promoter element in the form of a non-oxidizing compound selected from the group consisting of tellurium, tungsten, titanium, manganese, nickel, iron, copper, lead, rhenium, bismuth, tin, uranium, chromium, phosphorus and boron, said promoter element being added in a ratio of from about 0.0001 to 1.0 moles of promoter element per mole of molybdenum.

3,956,379

PROCESS FOR RECOVERING NTA

Phillip R. Beaver, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Oct. 23, 1970, Ser. No. 83,664
Int. Cl.² C07C 99/12, 101/20
U.S. Cl. 260—534 E 7 Claims

1. A process for recovering NTA from an aqueous system which comprises:

1. forming into a particulate stream a mixture of NTA in water, said mixture containing from about 56 to about 90 percent NTA by weight, and
2. contacting said stream with a hot gas stream whose temperature is from about 250° to about 1200°F to reduce the water content of the mixture to produce a dry particulate solid having a bulk density of from about 0.55 to about 0.85 **gram per cubic centimeter.**

3,956,380

POLYMERS CONTAINING HYDROXYLIC AND CARBOXYLIC GROUPS

Klaus Henning, Hurth; Karl Merkenich, Hurth-Efferen, and Joachim Kandler, Erfstadt Lechenich, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Mar. 12, 1973, Ser. No. 340,090
Claims priority, application Germany, Mar. 16, 1972, 2212623
Int. Cl.² C07C 59/12
U.S. Cl. 260—535 P 5 Claims

1. Builders for detergent and cleaning agents prepared by copolymerizing chloromaleic acid anhydride with alpha-chloracrylic acid followed by hydrolysis with water, the resulting hydrolyzates containing substantially between 54 and 73 weight % of free or lactonized carboxylic groups, and having a specific viscosity substantially between 0.1 and 0.2, determined on a 1 weight % solution in dimethyl formamide at 25°C, neutralizing the said hydrolyzates with aqueous sodium carbonate and subjecting the viscous solution so obtained to evaporation of the water for obtaining a dry product of the sodium salts of the hydrolyzates.

3,956,381

METHOD FOR PREPARATION OF ETHER POLYCARBOXYLIC ACIDS

Horst-Jürgen Krause, Dusseldorf-Holthausen, Germany, assignor to Henkel & Cie G.m.b.H., Dusseldorf, Germany

Filed Oct. 21, 1974, Ser. No. 516,208
Claims priority, application Austria, Mar. 4, 1974, 1758/74
Int. Cl.² C07C 59/22
U.S. Cl. 260—535 P 8 Claims

1. A process for the production of ether polycarboxylic acids consisting essentially of reacting an alkali metal salt of an ether carboxylic acid having the formula

R — O — CHR′ — COOH

wherein R is a member selected from the group consisting of alkyl having from 1 to 22 carbon atoms, hydroxy substituted alkyl having from 1 to 22 carbon atoms, carboxy substituted alkyl having from 1 to 22 carbon atoms, oxaalkyl having 3 to 22 carbon atoms, polyoxaalkyl having 5 to 32 carbon atoms and 2 to 6 hetero oxygens, and carboxy substituted oxaalkyl having 3 to 22 carbon atoms and R′ is a member selected from the group consisting of hydrogen and alkyl having from 1 to 4 carbon atoms with an excess of carbon dioxide in the presence of (1) at least an equimolar amount of an alkali metal alkyl carbonate having from 1 to 4 carbon atoms in the alkyl and (2) from 0 to 30% by weight, based on the weight of the reaction mixture of a heavy metal catalyst, an alkanol having 1 to 4 carbon atoms, a dialkyl carbonate having from 1 to 4 carbon atoms in the alkyl, a finely-divided inert diluent and an inert liquid diluent, at a temperature of between 200°C and 350°C under a pressure of at least 2 atmospheres gauge, for a time sufficient to effect carboxylation, and recovering said ether polycarboxylic acids.

3,956,382

PROCESS FOR THE PRODUCTION OF ETHER POLYCARBOXYLIC ACIDS

Horst-Jürgen Krause, Dusseldorf, Germany, assignor to Henkel & Cie G.m.b.H., Dusseldorf, Germany

Filed Oct. 21, 1974, Ser. No. 516,209
Claims priority, application Germany, Oct. 24, 1973, 2353176
Int. Cl.² C07C 59/22
U.S. Cl. 260—535 P 12 Claims

1. A process for the production of ether polycarboxylic acids consisting essentially of reacting an alkali metal salt of an ether carboxylic acid having the formula

R — O — CHR′ — COOH

wherein R is a member selected from the group consisting of alkyl having from 1 to 22 carbon atoms, hydroxy substituted alkyl having from 1 to 22 carbon atoms, carboxy substituted alkyl having from 1 to 22 carbon atoms, oxaalkyl having 3 to 22 carbon atoms, polyoxaalkyl having 5 to 32 carbon atoms and 2 to 6 hetero oxygens, and carboxy substituted oxaalkyl having 3 to 22 carbon atoms and R′ is a member selected from the group consisting of hydrogen and alkyl having from 1 to 4 carbon atoms with an excess of carbon dioxide in the presence of (1) at least an equimolar amount of an inorganic alkali metal compound selected from the group consisting of carbonates, bicarbonates and hydroxides and (2) from 0% to 30% by weight, based on the weight of the reaction mixture of

a heavy metal catalyst, a finely-divided inert diluent and an inert liquid diluent, at a temperature of between 200°C and 350°C under a pressure of at least 10 atmospheres gauge, for a time sufficient to effect carboxylation, and recovering said ether polycarboxylic acids.

3,956,383

METHOD FOR MANUFACTURING ETHER POLYCARBOXYLIC ACIDS

Horst-Jürgen Krause, and Günther Tischbirek, both of Dusseldorf-Holthausen, Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf, Germany

Filed Oct. 21, 1974, Ser. No. 516,210
Claims priority, application Austria, Mar. 4, 1974, 1759/74
Int. Cl.² C07C *59/22*
U.S. Cl. 260—535 P 10 Claims

1. A process for the production of ether polycarboxylic acids consisting essentially of reacting an alkali metal salt of an ether carboxylic acid having the formula

$$R - O - CHR' - COOH$$

wherein R is a member selected from the group consisting of alkyl having from 1 to 22 carbon atoms, hydroxy substituted alkyl having from 1 to 22 carbon atoms, carboxy substituted alkyl having from 1 to 22 carbon atoms, oxaalkyl having 3 to 22 carbon atoms, polyoxaalkyl having 5 to 32 carbon atoms and 2 to 6 hetero oxygens, and carboxy substituted oxaalkyl having 3 to 22 carbon atoms and R' is a member selected from the group consisting of hydrogen and alkyl having from 1 to 4 carbon atoms with an excess of carbon dioxide in the presence of (1) at least an equimolar amount of an alkali metal alcoholate of an alkanol having 1 to 4 carbon atoms and (2) from 0% to 70% by weight, based on the weight of the reaction mixture of a heavy metal catalyst, an alkanol having 1 to 4 carbon atoms, a dialkyl carbonate having 1 to 4 carbon atoms in the alkyl, a finely-divided inert diluent and an inert liquid diluent, at a temperature of between 200°C and 350°C under a pressure of at least 2 atmospheres gauge, for a time sufficient to effect carboxylation, and recovering said ether polycarboxylic acids.

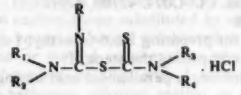
3,956,384

DITHIOCARBAMATE HYDROCHLORIDE SALTS AND THEIR MANUFACTURE

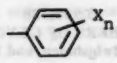
John F. Olin, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 506,671, Sept. 16, 1974, which is a division of Ser. No. 382,259, July 24, 1973, which is a division of Ser. No. 160,556, July 7, 1971, abandoned. This application Apr. 10, 1975, Ser. No. 567,050
Int. Cl.² C07C *153/00*
U.S. Cl. 260—545 R 6 Claims

1. A compound of the formula



wherein R is



wherein *n* is an integer of from 0 to 3 and X is lower alkoxy, R_1 and R_2 are each lower alkyl, lower alkenyl, lower alkynyl or benzyl having from 0 to 2 halo on the phenyl ring, and R_3 and R_4 and each lower alkyl or benzyl having from 0 to 1 halo on the phenyl ring.

3,956,385

PROCESS FOR PRODUCING SULFONYLAMIDES

Hideaki Suda, Takai; Tatsuo Kanda; Hiroshige Tomita, both of Toyonaka; Hirotoshi Nakanishi; Hiromu Hida, both of Minoo; Tatsumi Nuno, Toyonaka; Seiichi Akutsu, and Masayuki Maeyashiki, both of Kakogawa, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Apr. 16, 1974, Ser. No. 461,445
Claims priority, application Japan, Apr. 18, 1973, 48-44410; June 15, 1973, 48-68138
Int. Cl.² C07C *143/72*, *143/84*
U.S. Cl. 260—556 A 10 Claims

1. A method for preparing a sulfonylamide of the formula,

$$R—SO_2NHC_6H_4—Cl$$

wherein R is a $C_1 - C_6$ alkyl group, phenyl or phenyl substituted by a member selected from the group consisting of halogen, $C_1 - C_6$ alkyl, $C_1 - C_3$ alkoxy, acetyl, $C_1 - C_2$ acylamino, $C_1 - C_2$ alkyl amino or nitro, which comprises reacting a sulfonylhalide of the formula,

$$R—SO_2—X$$

wherein R is the same as defined above and X is a chlorine or bromine atom, with 2-chloroethylamine or a salt thereof in the presence of a base in a halogenated hydrocarbon solvent at a temperature of 0° to 80°C. and at a pH of 5 to 10.

3,956,386

CIS-N,N,N',N'-TETRAMETHYLCYCLOPROPANE-1,2-DICARBOXAMIDE AND USE THEREOF

Charles F. Hobbs, Des Peres, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed May 26, 1971, Ser. No. 147,242
Int. Cl.² C07D *103/737*
U.S. Cl. 260—557 R 1 Claim

1. cis-N,N,N',N'-Tetramethylcyclopropane-1,2-dicarboxamide.

3,956,387

MANUFACTURE OF CONCENTRATED AQUEOUS (METH)ACRYLAMIDE SOLUTIONS BY CATALYTIC ADDITION OF WATER TO (METH) ACRYLONITRILE

Toni Dockner, Meckenheim, and Rolf Platz, Mannheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Apr. 10, 1974, Ser. No. 459,457
Claims priority, application Germany, Apr. 19, 1973, 2320061
Int. Cl.² C07C *103/08*
U.S. Cl. 260—561 N 6 Claims

1. A process for the manufacture of aqueous solutions of an amide from the group consisting of acrylamide and methacrylamide by the addition of water to acrylonitrile or methacrylonitrile, wherein an aqueous solution containing the said amide and said nitrile in an initial ratio of from 1:1 to 1:7, respectively, is contacted with a conventional heterogeneous catalyst for said addition reaction at a temperature of from 40° to 150°C.

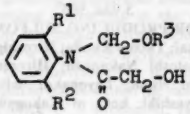
3,956,388

N-METHYLOL ETHERS OF GLYCOLLIC ANILIDES

Hanspeter Hansen, Ludwigshafen, and Wolfgang Rohr, Mannheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Mar. 20, 1975, Ser. No. 560,312
Int. Cl.² C07C *103/38*
U.S. Cl. 260—562 R 7 Claims

1. A glycollic anilide-N-methylol ether of the general formula:



in which
at least one of the radicals R^1 and R^2 is alkyl or alkoxy of one to four carbon atoms or halogen, one optionally being hydrogen, and R^3 is halo-, alkoxy- or cyano- substituted or unsubstituted alkyl, alkenyl, haloalkenyl or alkynyl of one to four carbon atoms.

3,956,389

PREPARATION OF SECONDARY ALKYL PRIMARY AMINES FROM CRUDE N-PARAFFIN OXIMES

Orville Wayne Rigdon, Groves; Lawrence Frank Kuntschik, and Robert Sammie Edwards, both of Nederland, all of Tex., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 430,119, Jan. 2, 1974, abandoned. This application Oct. 23, 1974, Ser. No. 517,130
Int. Cl.² C07C *85/10*
U.S. Cl. 260—563 D 27 Claims

1. A process for the manufacture of a secondary alkyl primary amine having from 10 to about 50 carbon atoms which comprises hydrogenating in a polar solvent and in the presence of ammonia and a supported metal hydrogenation catalyst, where said metal is platinum, rhodium, nickel or cobalt, a composition consisting essentially of an n-paraffin oxime having from 10 to about 50 carbon atoms contaminated with corresponding ketone and gem nitroso halide.

3,956,390

PREPARATION OF AMINES

Elijah H. Gold, West Orange, and Esther Babad, Bloomfield, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 29,665, April 17, 1970, abandoned. This application Oct. 1, 1970, Ser. No. 77,353
Int. Cl.² C07C *91/22*
U.S. Cl. 260—570.6 8 Claims

1. A process for the preparation of an amine comprising the steps of (*a*) reacting a sulfonamide with at least a stoichiometric amount of sodium bis-(2-methoxyethoxy) aluminum hydride, (*b*) decomposing the reaction product with an aqueous solution, and (*c*) recovering the amine.

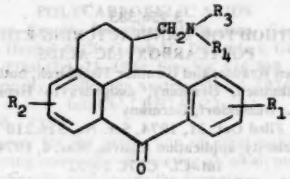
3,956,391

AMINO SUBSTITUTED TETRAHYDROPLEIADENES

William J. Houlihan, Mountain Lakes, and Jeffrey Nadelson, Lake Parsippany, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

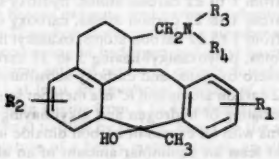
Division of Ser. No. 366,764, June 4, 1973, Pat. No. 3,879,462. This application Jan. 27, 1975, Ser. No. 543,982
Int. Cl.² C07C *87/29*
U.S. Cl. 260—570.9 2 Claims

1. A compound of the formula



where R_1 and R_2 each independently represent hydrogen or fluoro, and R_3 and R_4 each independently represent lower alkyl of 1 to 2 carbon atoms, provided R_1 is in the 9 or 10 position and R_2 is in the 4 or 5 position.

2. A compound of the formula



where R_1 and R_2 each independently represent hydrogen or fluoro, and R_3 and R_4 each independently represent lower alkyl of 1 to 2 carbon atoms, provided R_1 is in the 9 or 10 position and R_2 is in the 4 or 5 position.

3,956,392

1-CROTONYL-2,2,6-TRIMETHYLCYCLOHEXANES

Douwe Rienk de Haan, Soest, and Dirk Karel Kettenes, Putten, both of Netherlands, assignors to P.F.W. Beheer B.V., Amersfoort, Netherlands

Filed Oct. 24, 1973, Ser. No. 409,099
Claims priority, application United Kingdom, Oct. 26, 1972 49368/72
Int. Cl.² C07C *49/61*
U.S. Cl. 260—586 R 3 Claims

1. A 1-Crotonoyl-2,2,6-trimethylcyclohexane mixture comprising the following stereo isomers; trans,E-1-crotonoyl-2,2,6-trimethylcyclohexane, trans,Z-1-crotonoyl-2,2,6-trimethylcyclohexane, cis,E-1-crotonoyl-2,2,6-trimethylcyclohexane, and cis,Z-1-crotonoyl-2,2,6-trimethylcyclohexane.

3,956,393

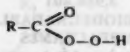
PROCESS FOR PREPARING ALPHA-SUBSTITUTED ACETALDEHYDES

Alan Owen Pittet, Atlantic Highlands, and Erich Manfred Klaiber, Neptune, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Sept. 19, 1974, Ser. No. 507,414
Int. Cl.² C07C *45/00, 47/42*
U.S. Cl. 260—598 5 Claims

1. The process for preparing 2,6,6-trimethyl-1-cyclohexen-1-ylacetaldehyde comprising the steps of:

i. Intimately admixing a peralkanoic acid having the structure:



wherein R is selected from the group consisting of hydrogen, ethyl and methyl with beta-ionone in the absence of dimethyl formamide solvent and in the presence of (a) a buffer selected from the group consisting of sodium acetate, sodium carbonate, potassium acetate and potassium carbonate; (b) a lower alkanoic acid selected from the group consisting of formic acid and acetic acid; and (c) a chloroform solvent inert to the action of the peralkanoic acid; and at a temperature in the range of 15°C up to 75°C, to form 2,6,6-trimethyl-1-cyclohexen-1-ylvinylacetate; said peracid being in slight molar excess with respect to said beta-ionone;

ii. Hydrolyzing said 2,6,6-trimethyl-1-cyclohexene-1-ylvinylacetate with either (a) an aqueous alcoholic solution of an alkali metal hydroxide selected from the group consisting of NaOH, KOH and LiOH, or (b) an aqueous solution of an alkali metal carbonate selected from the group consisting of sodium carbonate, potassium carbonate and lithium carbonate thereby forming 2,6,6-trimethyl-1-cyclohexen-1-ylacetaldehyde.

3,956,394

PROCESS FOR PURIFYING P-TOLUALDEHYDE

Susumu Fujiyama, and Minoru Takagawa, both of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Sept. 30, 1974, Ser. No. 510,610

Claims priority, application Japan, Oct. 11, 1973, 48-114074

Int. Cl.² C07C 45/24

U.S. Cl. 260—599 18 Claims

1. A process for purifying p-tolualdehyde, which comprises cooling a mixture of tolualdehyde isomers consisting essentially of p-tolualdehyde, o-tolualdehyde and m-tolualdehyde and having a mole fraction of at lest 0.27 of p-tolualdehyde on the basis of the total isomers to a crystallization temperature of −6° to −60°C, thereby crystallizing p-tolualdehyde, and separating the resulting p-tolualdehyde crystals from mother liquor.

3,956,395

DISTYRYLBENZENE DISULFONE DERIVATIVES

Hans Rudolf Meyer, Binningen, Switzerland

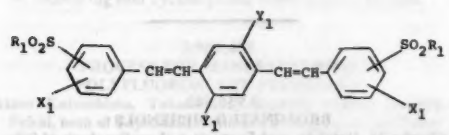
Filed Jan. 14, 1974, Ser. No. 433,177

Claims priority, application Switzerland, Jan. 23, 1973, 921/73

Int. Cl.² C07C 147/08

U.S. Cl. 260—607 A 6 Claims

1. A distyrylbenzene derivative of the formula



wherein R_1 represents alkyl with 1 to 6 carbon atoms or alkyl with 1 to 6 carbon atoms substituted by chlorine or hydroxy, cyclohexyl, benzyl or benzyl substituted in the phenyl moiety by chlorine or methyl or phenyl or phenyl substituted by chlorine, bromine, or alkyl with 1 to 6 carbon atoms, X_1 represents hydrogen, chlorine, methyl, or alkylsulphony with 1 to 4 carbon atoms, and Y_1 represents hydrogen, chlorine, methyl, or methoxy.

3,956,396

SAFE DIACYL PEROXIDE SOLUTION COMPOSITIONS

Orville L. Mageli; David C. Noller, both of Buffalo, N.Y., and Wilbur H. McKellin, Saint Louis, Mo., assignors to Pennwalt Corporation, Pa.

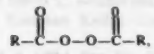
Continuation-in-part of Ser. No. 460,528, June, 1965, abandoned. This application Mar. 21, 1969, Ser. No. 809,443

Int. Cl.² C07C 179/14, 179/16

U.S. Cl. 260—610 D 18 Claims

1. A safe diacyl peroxide solution composition consisting essentially of:

a. a diacyl peroxide,



wherein R is an aliphatic group having 1-4 carbon atoms or sec.-phetyl, about 10–70% by weight; and

b. a safety solvent for said peroxide, about 90–30% by weight, said solvent being present in such an amount to render the solution composition safe, where said solvent is selected from the group consisting of aliphatic hydrocarbons, aliphatic ketones, aliphatic esters, aliphatic ethers, aliphatic alcohols and mixtures thereof, which boils in the range of about 140°–210°C at 760 mm. Hg, has a vapor pressure substantially the same as that of said peroxide, and does not have a deleterious effect on ordinary stability or catalytic activity of said peroxide.

3,956,397

PROCESS FOR EXTRACTING CYCLOALIPHATIC HYDROPEROXIDES

Lucien Billet, Lyon, and Michel Jouffret, Francheville-la-Bas, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed May 31, 1974, Ser. No. 475,042

Claims priority, application France, June 4, 1973, 73.20225

Int. Cl.² C07C 179/02

U.S. Cl. 260—610 A 8 Claims

1. In a process for extracting a cycloaliphatic hydroperoxide of the general formula:

in which R represents a hydrogen atom or an alkyl radical containing 1 to 4 carbon atoms, and R′ represents a saturated or ethylenically unsaturated divalent aliphatic radical containing 4 to 11 carbon atoms, optionally substituted by 1 or 2 alkyl radicals containing 1 to 4 carbon atoms or phenyl radicals from the reaction mixture resulting from the oxidation, by an oxygen-containing gas, of a cycloaliphatic hydrocarbon which comprises dissolving the hydroperoxide in a polar solvent which is not miscible with the hydrocarbon, the improvement wherein said solvent is selected from the class consisting of polymethylene-sulphone and an alkylene glycol carbonate, the alkylene portion containing 2 to 4 carbon atoms.

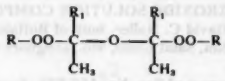
3,956,398

BIS-MONOPEROXYACETALS AND -KETALS

Frederick G. Schappell, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed May 16, 1975, Ser. No. 578,221
Int. Cl.² C07C 179/06
U.S. Cl. 260—610 R 6 Claims

1. A compound having the general structural formula



wherein R is selected from the group consisting of C_4–C_{12} tertiary alkyl and C_9–C_{12} tertiary alkylbenzyl. R_1 is selected from the group consisting of hydrogen and C_1–C_{12} alkyl.

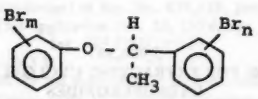
3,956,399

HALOGENATED-METHYLBENZYL PHENYL ETHERS

Frederick Paritee; John A. Alford, and Charles E. Reineke, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 16, 1970, Ser. No. 81,496
Int. Cl.² C07C 43/20
U.S. Cl. 260—612 R 5 Claims

1. A compound of the general formula



wherein
m and *n* are integers of 1–5
and more than about 50% by weight of the compound is Br.

3,956,400

DIISOPRENYL ETHER

Paul W. Solomon, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 12, 1975, Ser. No. 576,945
Int. Cl.² C07C 43/00
U.S. Cl. 260—614 R 1 Claim

1. Di(2-methylene-but-3-en-1-yl)ether.

3,956,401

LOW FOAMING, BIODEGRADABLE, NONIONIC SURFACTANTS

Michael Scardera, Hamden, and Robert N. Scott, Wallingford, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Mar. 10, 1975, Ser. No. 556,746
Int. Cl.² C07C 43/00, 43/04
U.S. Cl. 260—615 B 11 Claims

1. A surfactant product having the forumula:

wherein R is a linear, alkyl hydrocarbon having an average of from about 7 to about 10 carbon atoms, R′ is a linear, alkyl hydrocarbon of about 1 to about 4 carbon atoms, R″ is a linear, alkyl hydrocarbon of about 1 to about 4 carbon atoms, *x* is an integer of about 1 to about 6, *y* is an integer of about 4 to about 15, and *z* is an integer of about 4 to about 25.

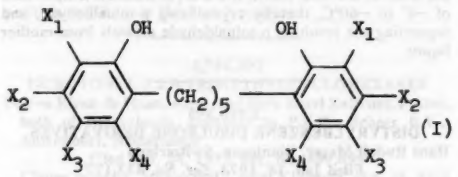
3,956,402

SUBSTITUTED BIS-HYDROXYPHENYL PENTANES

Max Schellenbaum, Muttenz, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 390,477, Aug. 22, 1973, abandoned. This application Feb. 12, 1975, Ser. No. 549,254
Claims priority, application Switzerland, Aug. 29, 1972, 12754/72
Int. Cl.² C07C 39/16
U.S. Cl. 260—619 B 3 Claims

1. Bis-hydroxyphenyl-alkanes of the formula I



wherein one of the radicals X_1 to X_4 represents chlorine, bromine, and the others represents hydrogen, chlorine, bromine, or alkyl with 1 to 4 carbon atoms.

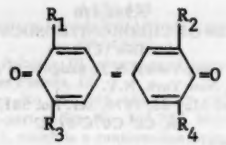
3,956,403

BROMINATED BIPHENOLS

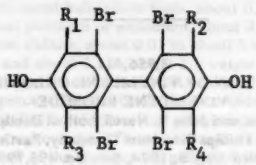
Charles M. Orlando, and Francois A. Lavallee, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 169,517, Aug. 5, 1971. This application Aug. 18, 1975, Ser. No. 605,399
Int. Cl.² C07C 37/00, 37/12
U.S. Cl. 260—620 6 Claims

1. A bromination process which comprises contacting liquid bromine with a diphenoquinone of the formula



where independently each R_1, R_2, R_3 and R_4 is a normal methyl, ethyl, propyl, butyl, pentyl, hexyl, heptyl or octyl radical or is a cyclohexyl radical, and recovering a biphenol of the formula



where each R_1, R_2, R_3 and R_4 is as previously defined.

3,956,404
PROCESS FOR PREPARING CYCLOALIPHATIC MONOTERPENIC ALCOHOLS

Cheves T. Walling, Salt Lake City, Utah, and Chester R. Willis, Maple Shade, N.J., assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 164,440, July 20, 1971, abandoned. This application Mar. 7, 1974, Ser. No. 449,147
Int. Cl.² C07C *33/05, 35/18*
U.S. Cl. 260—631.5 **5 Claims**

1. A process for preparing a cycloaliphatic monoterpenic alcohol selected from the group consisting of trans-carveol and perillyl alcohol comprising the steps of

i. preparing a mixture of
   a. an isomeric pinene selected from the group consisting of alpha-pinene and beta-pinene,
   b. a cuprous salt selected from the group consisting of cuprous chloride and cuprous bromide,
   c. a polar solvent selected from the group consisting of acetonitrile and a 1:1 benzene:acetic acid mixture, and
   d. benzoyl peroxide,

said pinene being in molar excess with relation to said benzoyl peroxide in a ratio of from about 1:1 to about 5:1, said cuprous salt being in a catalaytic amount,

ii. heating said mixture at a temprature of about 40°C to about 85°C, whereby a benzoate ester is formed,

iii. hydrolyzing said ester in an alkaline aqueous alcoholic medium, thereby forming said cycloaliphatic monoterpenic alcohol,

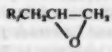
iv. recovering said cycloaliphatic monoterpenic alcohol.

3,956,405
PROCESS FOR MANUFACTURING POLYFLUOROALKYL PROPANOLS

Atsuo Katsushima, Takarazuka; Shinichi Imazu; Shoshin Fukui, both of Toyonaka; Akitoshi Iwatani, Suita, and Tadashi Akazawa, Ibaragi, all of Japan, assignors to Daikin Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Feb. 25, 1974, Ser. No. 445,324
Claims priority, application Japan, Feb. 27, 1973, 48-23979
Int. Cl.² C07C *31/34*
U.S. Cl. 260—633 **6 Claims**

1. In the process for producing a polyfluroalkyl secondary propanol by catalytically reducing with hydrogen a polyfluoroalkylpropylene oxide having the formula



wherein R_f is a polyfluoroalkyl group having 1–20 carbon atoms and the catalyst employed is selected from the group consisting of platinum, palladium, reduced nickel, nickel oxide, Raney nickel and copper-chronium oxide catalysts, the improvement comprising carrying out said reduction in the presence of an effective amount of a weakly basic substance having a basic dissociation constant (pKb) at 25°C. of at least 1 and at a temperature of 10° to 70°C.

3,956,406
PURIFICATION OF TRIMETHYLOLPROPANE

Billy W. Palmer, and David L. Bondurant, both of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 4, 1974, Ser. No. 512,826
Int. Cl.² C07C *29/24*
U.S. Cl. 260—637 P **8 Claims**

1. A proces for the purification of trimethylolpropane prepared by the condensation of n-butyraldehyde and formaldehyde in the presence of an aqueous alkali reaction medium which consists of the following steps:

1. extracting the trimethylolpropane from the aqueous alkali medium by the addition of 2 volumes of isobutanol per volume of aqueous alkali feed;
2. diluting the isobutanol/trimethylolpropane extract with 1 volume of xylene per volume of isobutanol initially used;
3. distilling the xylene/isobutanol/trimethylolpropane so as to recover the isobutanol as an overhead stream;
4. cooling the xylene trimethylolpropane bottom stream from the aforementioned distillation step so as to allow the trimethylolpropane to separate from the xylene.

3,956,407
ALKENOL PRODUCTION

Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 29, 1974, Ser. No. 474,254
Int. Cl.² C07C *27/00, 29/00*
U.S. Cl. 260—638 R **15 Claims**

1. A process for the production of alkenols or cycloalkenols which comprises reacting

a. at least one olefinic compound selected from the group consisting of alkenes and cycloalkenes having from 3 to 20 carbon atoms per molecule and at least one allylic hydrogen with
b. formaldehyde in the presence of
c. a reaction diluent comprising aromatic compounds of the formula $Ar(Z)_n$ wherein Ar is an aromatic hydrocarbyl radical whose valence is n, n is 0, 1, or 2, and wherein Z is a substituent selected from the group consisting of Cl— and R—O—, and where R is a hydrocarbyl radical of 1–10 carbon atoms, and
d. a catalyst selected from the group consisting of bromine, metal bromides of Group IA metals, iodine, and metal iodides of Group IA metals, supported on a member selected from the group consisting of alumina, silica, silica-alumina, clays, carbon, and pumice, at an elevated temperature and pressure sufficient to produce alkenols or cycloalkenols.

3,956,408
PREPARATION OF UNSATURATED ALCOHOLS

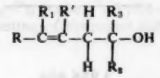
Raymond A. Schell, Oxford, and Lawrence J. Kehoe, Huntington Woods, both of Mich., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 322,470, Jan. 10, 1973, abandoned, which is a continuation-in-part of Ser. No. 49,160, June 23, 1970, abandoned, which is a continuation-in-part of Ser. No. 776,788, Nov. 18, 1968, abandoned. This application June 5, 1975, Ser. No. 583,880

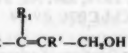
Int. Cl.² C07C *29/00, 27/00*

U.S. Cl. 260—638 R **18 Claims**

1. A process for preparing mono-olefinically unsaturated alcohols having the formula



wherein R, R', R_1, R_2 and R_3 have the meanings given below which comprises the reaction of (i) an allylic alcohol having the formula



wherein R, R' and R_1 are independently selected from the group consisting of hydrogen and alkyl, cycloalkyl, aryl, alkaryl, and aralkyl groups having from 1 to about 9 carbon atoms, and (ii) a carbonyl compound selected from the class consisting of alkyl ketones or alkyl aldehydes and mixtures thereof having the Formula

wherein R_2 and R_3 are independently selected from the class consisting of hydrogen and alkyl groups having from 1 to 9 carbon atoms, in the presence of an amount of carbon monoxide sufficient to provide at least 1 mole of carbon monoxide for every mole of reacted allylic alcohol, and a catalytic amount of a catalyst combination of (a) an inorganic Group VIII noble metal salt selected from the group consisting of the halides, the sulfates, phosphates, phosphites, carbonates, borates, sulfites, nitrates, nitrites, and salts derived from hydrohalo acids, and (b) an inorganic salt of a metal selected from tin and germanium selected from the group consisting of halides, sulfates, sulfites, phosphates, phosphites, borates, carbonates, nitrates and nitrites, at a temperature and pressure sufficient for said allylic alcohol and said carbonyl compound to coreact in the presence of carbon monoxide and said catalyst to form said unsaturated alcohols.

3,956,409
PROCESS FOR PURIFYING TNT

Everett E. Gilbert, Morristown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 10, 1975, Ser. No. 585,735

Int. Cl.² C07C *79/10*

U.S. Cl. 260—645 **8 Claims**

1. A process for purifying 2,4,6-trinitrotoluene containing unsymmetrical trinitrotoluene isomeric impurities, which comprises reacting the impure 2,4,6-trinitrotoluene with an aqueous solution consisting essentially of ammonium sulfite to convert sais isomeric impurities into products soluble in said aqueous solution, and separating the purified 2,4,6-trinitrotoluene from the aqueous solution containing said soluble conversion products.

3,956,410
PURIFICATION OF CHLORONITROSOCYCLOHEXANE DIMER (CNCD)

Fred W. Koff, Long Valley, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

Filed May 28, 1975, Ser. No. 581,468

Int. Cl.² C07C *81/02*

U.S. Cl. 260—647 **11 Claims**

1. A process for the purification of chloronitrosocyclohexane dimer (CNCD) comprising admixing said CNCD in a chlorinated aliphatic hydrocarbon or aromatic hydrocarbon selected from benzene or toluene or mixtures thereof until substantial dissolution of the CNCD has occurred, displacing said solvents with a higher boiling alkyl alcohol and separating the purified CNCD that crystallizes.

3,956,411
ALKYLATION OF VINYLIDENE CHLORIDE AND VINYLIDENE BROMIDE

John E. Mahan, and John R. Norell, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 8, 1974, Ser. No. 495,799

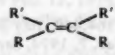
Int. Cl.² C07C *17/26, 21/04, 21/02, 25/18*

U.S. Cl. 260—648 R **12 Claims**

1. A process for the production of alkylated vinylidene chlorides or vinylidene bromides which comprises reacting

a. at least one of 1,1-dichloroethylene and 1,1-dibromoethylene with

b. at least one alkylating agent selected from the group consisting of olefins of the formula



wherein the total number of carbon atoms is 4 to 20, R and R' represent hydrogen or alkyl containing 1 to 12 carbon atoms with the proviso that R is hydrogen if two R' groups together represent an alkylene group containing 3 to 6 carbon atoms, or a cyclo alkylene group containing 5 or 6 carbon atoms or an alkenylene group containing 6 carbon atoms, tert-alkyl halides, and second or tertiary alcohols, in

c. a reaction medium containing 75–100 weight percent trifluoromethanesulfonic acid and, based on total reaction medium, from 0–25 weight percent water, from 0–25 weight percent methanol, and from 0–10 weight percent BF_3.

3,956,412
PROCESS FOR THE ADDITION OF PERFLUOROALKYL IODIDES TO GASEOUS HALOGENATED OLEFINS

Martin Knell, Ossining, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 159,513, July 2, 1971, abandoned, which is a continuation-in-part of Ser. No. 4,179, Jan. 1, 1970, abandoned, which is a continuation of Ser. No. 693,148, Dec. 26, 1967, abandoned. This application Aug. 31, 1973, Ser. No. 393,355

Int. Cl.² C07C *17/28*

U.S. Cl. 260—653.1 T **7 Claims**

1. A process for the addition of perfluoroalkyl iodides of the formula $C_nF_{2n+1}I$, wherein *n* is an integer of 4–14, which are liquid at reaction temperature, to halogenated olefins which are gaseous at the employed reaction temperature, which comprises bubbling said olefin through said liquid iodide, in the presence of a free radical generating catalyst, at atmospheric or less than atmospheric pressure, at a reaction temperature of about 50°C to about 220°C, and recovering the reaction addition product.

3,956,413

HYDROCARBON ISOMERIZATION CATALYST AND PROCESS

John C. Hayes, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Division of Ser. No. 456,705, March 29, 1974, which is a continuation-in-part of Ser. No. 365,782, May 31, 1973, Pat. No. 3,839,193, which is a continuation-in-part of Ser. No. 27,457, April 10, 1970, abandoned. This application Feb. 24, 1975, Ser. No. 552,523

Int. Cl.² C07C 5/24

U.S. Cl. 260—668 A 17 Claims

1. A process for isomerizing an isomerizable hydrocarbon which comprises contacting said hydrocarbon, at isomerization conditions, with a catalytic composite comprising a refractory inorganic oxide having combined therewith, on a Friedel-Crafts metal halide-free basis, about 0.01 to about 2 weight precent platinum or palladium, about 0.01 to about 2 weight percent iridium, about 0.01 to about 5 weight percent germanium, and about 0.1 to about 3.5 weight percent halogen, calculated on an elemental basis, and about 1.0 to about 100 weight percent Friedel-Crafts metal halide, wherein the platinum or palladium, iridium and germanium are uniformly dispersed throughout the refractory inorganic oxide wherein substantially all of the platinum or palladium and iridium are present in the corresponding metallic states and wherein substantially all of the germanium is present in an oxidation state above that of the elemental metal.

3,956,414

METHOD FOR MELTING AND CRACKING AMORPHOUS POLYOLEFIN

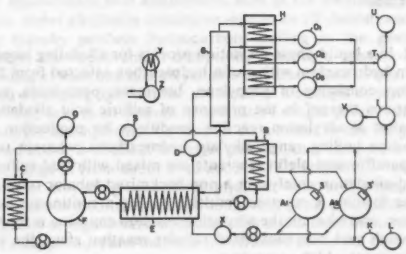
Katsutoshi Oshima, No. 2-31, Tokiwadai, Itabashiku, Tokyo, Japan

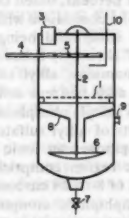
Filed Jan. 18, 1974, Ser. No. 434,460

Claims priority, application Japan, Sept. 6, 1973, 48-99709

Int. Cl.² C07C 3/26

U.S. Cl. 260—683 R 7 Claims





1. A method for melting and thermally cracking a solid, amorphous polyolefin material comprising, maintaining a melted body of amorphous polyolefin material at a temperature of about 130°C to 300°C for a period of time sufficient to reduce the viscosity thereof to about 5 to 250 cps, maintaining a bed of lumps of solid, amorphous polyolefin material on an elevated, perforated support, passing at least a portion of said melted polyolefin material of reduced viscosity through said bed of lumps of polyolefin material at a rate sufficient to maintain a weight ratio of said melted polyolefin of reduced viscosity to said lumps of polyolefin material of at least 5/1 and melt said lumps of polyolefin material, separating a liquid phase of said melted polyolefin material from a sludge phase, containing unmelted impurities, passing a portion of said liquid phase to said melted body of polyolefin to replenish the same, cracking the remainder of said liquid phase at a temperature of about 250°C to 450°C and recovering a liquid oil product from the effluent of the cracking step.

3,956,415

PLURAL STAGE DISTILLATION WITH INTERMEDIATE INDIRECT HEAT EXCHANGE, OF FEED STREAMS COMPRISING ETHYLENE AND METHANE

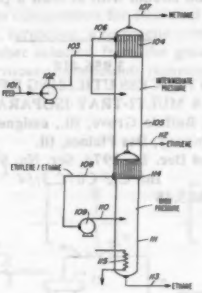
Donald R. Cummings, Cheltenham, England, and Kenneth J. O'Sullivan, Milson's Point, Australia, assignors to Petrocarbon Developments Limited, Manchester, England

Filed Mar. 4, 1975, Ser. No. 555,118

Claims priority, application United Kingdom, Mar. 4, 1974, 9670/74

Int. Cl.² C07C 3/28, 5/32, 11/02

U.S. Cl. 260—683 R 19 Claims



1. A method of supplying methane and ethylene from a mixture thereof at a location which is geographically remote from the origins of said methane and ethylene, said method comprising the steps of:

transporting a volume of a liquefied hydrocarbon mixture consisting essentially of methane, ethane and ethylene to said location from another location which is nearer the origins of said methane and ethylene;

compressing the mixture to a first superatmospheric pressure;

feeding the mixture at said first superatmospheric pressure and at a temperature below its bubble point at said pressure to a first distillation column and fractionating the mixture into an overhead gaseous methane stream and a liquid bottoms fraction comprising ethylene and ethane;

withdrawing a first portion of said liquid bottoms fraction from said first distillation column, increasing the pressure thereof to a second superatmospheric pressure which is above said first superatmospheric pressure and feeding it at said second superatmospheric pressure and at a temperature below its bubble point at said second pressure to a second distillation column and distilling said liquid bottoms fraction in said second distillation column to provide a gaseous ethylene stream which is recovered overhead;

producing the reflux for said first distillation column by condensing a portion of said gaseous methane stream and

returning it to said first column, the condensation being effected substantially entirely by indirect heat exchange between said gaseous methane stream and said compressed liquefied hydrocarbon mixture in a temperature range below the bubble point of said mixture and prior to feeding said mixture to said first distillation column; and

producing the reflux for said second distillation column by evaporating a second portion of the liquid bottoms fraction formed in said first distillation column in indirect heat exchange with said gaseous ethylene stream whereby to condense a portion of said gaseous ethylene stream, and returning said condensed portion to said second column, the evaporated second portion of the liquid bottoms fraction constituting re-boil for said first distillation column.

5. A method as claimed in claim **1** wherein said hydrocarbon mixture is a mixture of (a) a substantially acetylene-free C_{1-2} hydrocarbon composition derived from cracker gas and (b) a hydrocarbon composition which is substantially free of C_3 and higher hydrocarbons and which is derived from natural gas.

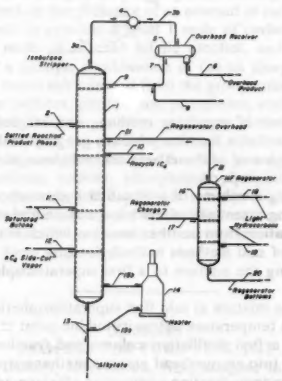
7. A method as claimed in claim **5** in which said hydrocarbon mixture has been obtained by distilling natural gas to provide a first stream containing methane and a second stream consisting essentially of C_2 and higher hydrocarbons, cracking said second stream to form a cracker gas, deriving a substantially acetylene-free C_{1-2} hydrocarbon stream from said cracker gas and combining at least a portion of said acetylene-free hydrocarbon stream with at least a portion of said first stream.

3,956,416

ALKYLATION PROCESS UTILIZING HF REGENERATOR STREAM TO A MULTI-TRAY ISOPARAFFIN STRIPPER

Bipin V. Vora, Buffalo Grove, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 16, 1974, Ser. No. 533,421
Int. Cl.² C07C *3/54*
U.S. Cl. 260—683.48 **2 Claims**



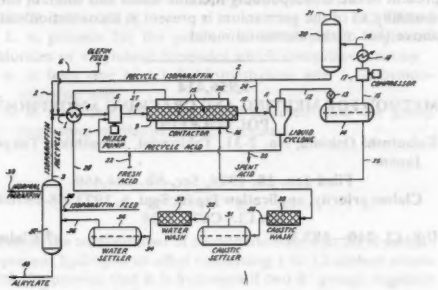
1. In a process for producing an alkylation reaction product from an isoparaffin reactant and an olefin-acting reactant utilizing hydrogen fluoride catalyst wherein said reactants and said catalyst are admixed in a reactor at alkylation conditions; a reactor effluent is settled to form a settled catalyst phase containing acid soluble oils and a settled hydrocarbon product phase containing unreacted isoparaffin; the improved method which comprises introducing at least a portion of said settled hydrocarbon product phase into a multi-tray isoparaffin stripper at an intermediate locus in the stripper, withdrawing a side-cut recycle stream containing isoparaffin reactant from said multi-tray isoparaffin stripper at a locus below the inlet locus of said settled reaction product phase; introducing at least a portion of said settled catalyst phase into a catalyst regenerator and therein contacting the catalyst phase at regeneration conditions with a light hydrocarbon to strip hydrogen fluoride from acid soluble oils, withdrawing acid soluble oils from a lower part of said regenerator, passing stripped hydrogen fluoride and said light hydrocarbon as a regenerator overhead vapor stream from an upper part of said regenerator to said multi-tray isoparaffin stripper at a locus below said intermediate locus at which said settled reaction product phase is introduced and above said locus at which said side-cut recycle stream is withdrawn.

3,956,417

ISOPARAFFIN-OLEFIN ALKYLATION UTILIZING A CONTINUOUS SULFURIC ACID PHASE IN A TUBULAR REACTION ZONE

William F. Franz, Cardiner, and Edward L. Cole, Fishkill, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Oct. 18, 1974, Ser. No. 515,943
Int. Cl.² C07C *3/54*
U.S. Cl. 260—683.63 **12 Claims**



1. In a liquid phase alkylation process for alkylating isoparaffin hydrocarbon with olefin hydrocarbon selected from the group consisting of propylene, butylenes, pentylenes, and mixtures thereof in the presence of sulfuric acid alkylation catalyst at alkylation reaction conditions for production of gasoline boiling range alkylate hydrocarbons, wherein said isoparaffin and olefin reactants are mixed with said sulfuric acid alkylation catalyst in a non-backmixed tubular reaction zone forming a reaction emulsion having a continuous acid phase, and wherein the alkylation reaction emulsion is flowed through said non-backmixed tubular reaction zone; the improvement which comprises:

a. maintaining, in said reaction emulsion from about 0.0005 to about 0.5 weight percent, based on sulfuric acid catalyst, of an amphiphilic compound which forms micelles in acid solution, said compound being selected from the group consisting of N-(alkyl) benzene sulfonamides, N-(alkyl) alkyl sulfonamides, alkyl sulfonium salts, alkyl phosphonium salts, alkyl benzene sulfonic acids, aliphatic amines, NN'N'' tris (alkyl) phosphonic triamides, ammonium salts, and salts of alkyl sulfates, the molecules of said compound comprises an ionic hydrophillic region and a hydrophobic region comprising a non-polar aliphatic alkyl radical of 8 to 24 carbon atoms, wherein the amount of said amphiphilic compound is sufficient to dissolve at least about one weight percent of said isoparaffin reactant into said sulfuric acid alkylation catalyst in said reaction emulsion

b. flowing said reaction emulsion of step (a) through said non-back mixed tubular reaction zone for a time sufficient to convert essentially all the olefin reactant, at a Reynolds number of at least about 5000 NRE sufficient

to maintain the isoparaffin, olefin, and sulfuric acid alkylation catalyst within said reaction emulsion; and

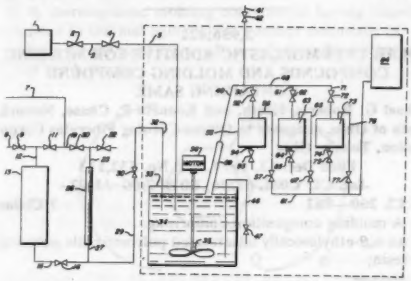
c. centrifugally separating, in a separation zone, the reaction zone emulsion effluent from step (b) into a hydrocarbon phase comprising unreacted isoparaffin hydrocarbon and alkylate hydrocarbon, and an acid catalyst phase under dynamic separation conditions such that said separated hydrocarbon phase is immediately removed from contact with said separated acid catalyst phase.

3,956,418

ISOPARRAFIN ALKYLATION UTILIZING A CATALYST OF SULFURIC ACID AND HYDROFLUORIC ACID

David A. McCaulay, Homewood, Ill., assignor to Amoco Oil Company, Chicago, Ill.

Filed Nov. 27, 1974, Ser. No. 527,713
Int. Cl.² C07C 3/54
U.S. Cl. 260—683.63 **12 Claims**



1. In combination with a process for conducting liquid-phase alkylation of at least one alkylatable isoparaffin with at least one alkylating agent selected from the class consisting of an olefin and an alkyl sulfate ester in the presence of a mixture of hydrofluoric acid and sulfuric acid as the alkylation catalyst, under alkylation conditions, and in an alkylation reactor, to thereby produce hydrocarbons boiling in the gasoline range, the improvement comprising reacting a mixture containing at least one said alkylatable isoparaffin and at least one said alkylating agent in the presence of a catalyst comprising sulfuric acid in an amount of at least 94 weight percent of the catalyst and hydrofluoric acid in an amount in the range of from about 2 to about 6 weight percent, at a temperature in the range of from about 0° to about 20°C., and with a volume ratio of alkylating agent-to-catalyst per hour in the range of from about 0.05 to about 0.8, to thereby produce a maximum amount of high-octane hydrocarbons and a maximum-octane alkylate product and increase the effective life of the catalyst.

3,956,419

ORGANIC REINFORCING FILLERS FOR SILICONE RUBBER

James G. Murray, East Brunswick, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 5, 1973, Ser. No. 422,123
Int. Cl.² C08F 212/08, 2/14, 212/36
U.S. Cl. 260—827 **10 Claims**

1. A process for producing an organic reinforcing filler for rubber that comprises slurry polymerizing a reaction mixture comprising styrene, divinylbenzene in an amount of 0.5–15 weight per cent based on styrene, and an anionic polymerization initiator dispersed in a liquid aliphatic hydrocarbon slurrying medium in presence of from about 0.1 to about 10 weight percent based upon the styrene reactant of an AB or ABA block polymer dispersing agent, in which segment A is derived from styrene in an amount of 5–80 weight percent styrene based on total block polymer and segment B is derived from t-butylstyrene, butadiene, isoprene, or 2, 2-dimethylbutadiene, to produce a finely divided solid cross-linked polymer, said anionic polymerization initiator comprising an alkali metal-bearing compound capable of initiating polymerization of styrene but without imparting, to the resulting finely divided polymer, groups substantially reactive with silicone rubber in rubber cure, and terminating the slurry polymerization in the presence of a terminating agent reactive with the cross-linked polymer to impart thereto groups reactive with silicone rubber in a rubber cure operation; said terminating agent being hexamethylcyclotrisiloxane, vinyldimethylchlorosilane, allyldimethylchlorosilane, vinylmethyldichlorosilane, allylmethyldichlorosilane, air followed by acetyl chloride forming a peracetate ester, air followed by benzoyl chloride forming a perbenzoate ester, or air followed by acetic acid forming a hydroperoxide.

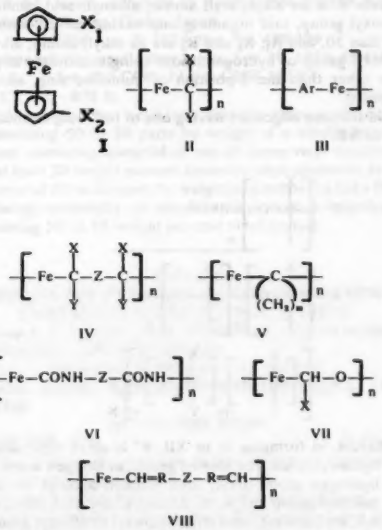
3,956,420

POLYOLEFIN COMPOSITION FOR ELECTRICAL INSULATION

Hirosi Kato, and Nobuyuki Maekawa, both of Amagasaki, Japan, assignors to Dainichi-Nippon Cables, Ltd., Hyogo, Japan

Filed Sept. 3, 1974, Ser. No. 502,380
Claims priority, application Japan, Sept. 3, 1973, 48-99481; Sept. 3, 1973, 48-99486
Int. Cl.² C08J 3/20
U.S. Cl. 260—827 **11 Claims**

10. A polyolefin composition for electrical insulation comprising polyolefin, ferrocene, a ferrocene compound which is at least one member selected from the group consisting of ferrocene and ferrocene compounds represented by the following formulae I to VIII:



wherein, in formula I, X_1 and X_2 are each hydrogen or halogen atom, or alkyl, aryl, acyl, amino, carboxyl, carboalkoxyl or silyl group, respectively;

in formulae II to VIII, Fe is ferrocene ($X\text{-}C_5H_3\text{-}Fe\text{-}C_5H_4$) skeleton, —Fe— is a 1,2-, 1,3-, or 1,1′-disubstituted ferrocenylene unit and n is an integer of 2 to 10,000;

in formula II, X and Y are halogen or hydrogen atom, or alkyl, alkenyl, aryl, aralkyl, aralkenyl, hydroxyl or alkoxyl group, respectively;

in formula III, Ar is o-, m- or p-phenylene or other arylene group, such as naphthylene or anthracenylene, with or without a substituent thereon;

in formula IV, X and Y are each the same as X and Y of formula II, or X and Y may form a carbonyl group together with the carbon atom connected with X and Y, and Z is alkylene, arylene, aralkylene, alkenylene or aralkenylene group;

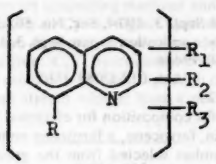
in formula V, m is an integer of 2 to 12 and the carbon ring composed of carbon atoms and $-(CH_3)_m-$ may contain an unsaturated bond and have a substituent thereon;

in formulae VI and VIII, Z is the same as Z in formula IV, R in formula VIII being nitrogen atom or methine group;

in formula VII, X is the same as X in formula II;

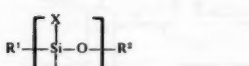
said organic groups, X_1, X_2 in formula I, X, Y in formulae II and IV, and X in formula VII having carbon atoms of less than 30; and

said organic groups, Ar in formula III and Z in formulae IV, VI and VIII, having carbon atoms of less than 40, 8-substituted quinoline compound having the formula

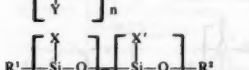


wherein R is an alkyl, aryl, amino, alkenyl, acyl, amide or hydroxyl group, said organic group having carbon atoms of less than 30, and R_1, R_2 and R_3 are an alkyl, amino, alkoxyl, carboxyl group or hydrogen, those being substituted at positions other than the 8-position of quinoline ring, siloxane oligomer,

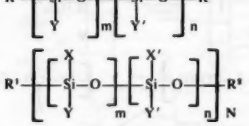
said siloxane oligomers having one of following formulae X to XII:



X



XI



XII

wherein, in formulae X to XII, R^1 is alkyl, aryl, alkoxyl, hydroxyl, aralkyl or alkenyl group, or halogen atom, R^2 is hydrogen atom, alkyl, aryl, aralkyl, alkenyl, or alkylhalosilyl group and X, Y, X′ and Y′ are each alkyl, alkenyl, aryl, aralkyl, aralkenyl, hydroxyl or alkoxyl group, or halogen atom, each group R^1, R^2, X, Y, X′ and Y′, having carbon atoms less than 15,

in formula X, *n* is an integer of 2 to 100, while in formula XI, *m* and *n* are each an integer of 1 to 60, said siloxane oligomers represented by formulae X and XI having a molecular weight of about 350 to about 30,000, in formula XII, N is 2 to 50,

in formula XI, X, X′, Y, and Y′ may be different from each other except that X is identical to X′, and Y to Y′, and also except that X, X′, Y, and Y′ are all identical curing atent and unsaturated polymer, the total mount of the ferrocene compound, the 8-substituted quinoline compound and siloxane oligomer being 0.01 to 20 parts by weight per 100 parts by weight of polyolefin, the ratio of the 8-substituted quinoline compound and the siloxane oligomer to the ferrocene compound being 0.05 to 20 parts by weight of the 8-substituted quinoline compound and 0.05 to 20 parts by weight of the siloxane oligomer per one part by weight of the ferrocene compound, the amount of the curing agent being 0.5 to 10 parts by weight of per 100 parts by weight of the polyolefin, said unsaturated polymer being one containing at least 0.5 unsaturated bond or unsaturated atomic group selected from the group consisting of C=C, aromatic ring and C≡N per unit structure constituting the unsaturated polymer, the amount of said unsaturated polymer being 0.05 to 10 parts by weight per one part by weight of the total amount of the ferrocene compound, the 8-substituted quinoline compound and the siloxane oligomer.

3,956,421

POLAR THERMOPLASTIC ADDITIVE FOR MOLDING COMPOUNDS AND MOLDING COMPOUND CONTAINING SAME

Michael G. Roberts, Heath, and Kenneth P. Chase, Newark, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 12, 1974, Ser. No. 532,113

Int. Cl.² C08L *67/06*; B01F *7/00*, *15/02*

U.S. Cl. 260—862 **7 Claims**

1. A molding composition comprising:

a. an α,β-ethylenically unsaturated polymerizable polyester resin;

b. styrene;

c. a thermoplastic resin comprising a copolymer of a nonpolar, olefinically unsaturated monomer and an olefinically unsaturated monomeric reactant containing polar reactant portions and selected from the group consisting of hydroxyethyl acrylate, hydroxypropyl acrylate, unsaturated amines, unsaturated lactams, unsaturated alcohols and unsaturated diesters of phosphorus acid.

3,956,422

POLYESTER MODIFIERS FOR VINYL HALIDE POLYMERS

Akio Takahashi, Amherst; Geoffrey H. Smith, North Tonawanda, and George C. Hopkins, Clarence, all of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 491,190, July 24, 1974, abandoned. This application Jan. 31, 1975, Ser. No. 545,942

Int. Cl.² C08L *67/06*

U.S. Cl. 260—873 **7 Claims**

1. A polymer composition comprising:

1. a bulk polymerized vinyl halide graft polymer comprising at least about 80% by weight of a vinyl halide component and about 0.05% to about 20% by weight, of said vinyl halide component, of a polyolefin, said graft polymer containing said vinyl halide grafted upon said polyolefin and

2. a polyester of number average molecular weight of about 1,000 to about 10,000 comprising a polycarboxylic component and a polyhydric component wherein said polycarboxylic component comprises at least about 75 mole percent of a halogenated bicycloheptene polycarboxylic compound, and wherein said polyhydric component comprises at least about 75 mole percent of ethylene glycol, ethylene oxide or mixtures thereof with the proviso that no more than about 5 mole percent of said polycarboxylic component are polycarboxylic components containing more than two carboxylic functional groups per molecule and no more than about 5 mole percent of said polyhydric component are polyhydric components containing more

than two hydroxy groups or more than one oxide group per molecule.

3,956,423

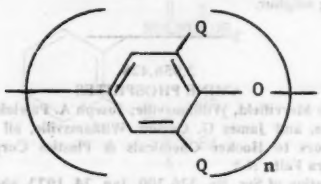
POLYPHENYLENE ETHERS COMPOSITION CONTAINING N,N'-DI-β-NAPHTHYL-P-PHENYLENE DIAMINE STABILIZER

Arthur Katchman, Delmar, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Nov. 25, 1974, Ser. No. 527,141
Int. Cl.² C08L 23/00; C08K 5/16
U.S. Cl. 260—874 12 Claims

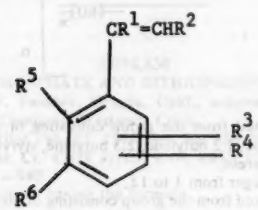
1. A thermoplastic molding composition having improved resistance to thermal aging which consists essentially of:

a. from 10–90 parts by weight a polyphenylene ether resin of the formula



wherein the oxygen ether atom of one unit is connected to the benzene nucleus of the next adjoining unit, *n* is a positive integer and is at least 50, and each Q is a monovalent substituent selected from the group consisting of hydrogen, halogen, hydrocarbon radicals free of a tertiary alpha carbon atom, halohydrocarbon radicals having at least two carbon atoms between the halogen atom and the phenyl nucleus, hydrocarbonoxy radicals and halohydrocarbonoxy radicals having at least two carbon atoms;

b. from 90–10 parts by weight of a vinyl aromatic resin wherein at least 25% of the units of said vinyl aromatic resin are derived from a monomer of the formula:



wherein R^1 and R^2 are selected from the group consisting of lower alkyl or alkenyl groups of from 1 to 6 carbon atoms and hydrogen; R^3 and R^4 are selected from the group consisting of choloro, bromo, hydrogen and lower alkyl of from 1 to 6 carbon atoms, R^5 and R^6 are selected from the group consisting of hydrogen, lower alkyl and alkenyl groups of from 1 to 6 carbons or R^5 and R^6 may be concatenated together with hydrocarbyl groups to form a naphthyl group and from 0.1 to 10 parts by weight of N,N'-di-γ-naphthyl-p-phenylene diamine sufficient to improve the resistance of said composition to thermal aging.

3,956,424

PHOTO-DEGRADABLE RESIN COMPOSITION

Naohiro Murayama; Takayuki Katto; Yo Iizuka, and Teruo Sakagami, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 28, 1973, Ser. No. 429,636
Claims priority, application Japan, Dec. 29, 1972, 48-3597; Feb. 22, 1973, 48-21499; June 27, 1973, 48-72679
Int. Cl.² C08L 51/00
U.S. Cl. 260—876 R 8 Claims

1. A photodegradable resin composition which on exposure to light readily becomes brittle whereby it is easily broken by a slight shock applied thereto which consists essentially of:

A. 50 to 99 parts by weight of a graft copolymer containing at least 30% by weight of butadiene as the monomeric unit thereof, said copolymer being composed of:

1. 40 to 80 parts by weight of a homopolymer of butadiene, or a copolymer of butadiene and a monomer or a mixture of monomers copolymeriazble therewith with butadiene as the principal constituent, and

2. 60 to 20 parts by weight of a monomeric mixture consisting of styrene and methyl methacrylate, and 0.01 to 5 parts by weight of a cross-linking agent copolymerizable with said monomers, said monomeric component (2) being graft-polymerized upon said butadiene polymer component (1); and

B. 50 to 1 part by weight of a homopolymer of styrene, methyl methacrylate, acrylonitrile, vinyl chloride or vinylidene chloride, or a copolymer of said monomers as the principal constituent and other monomers copolymerizable therewith.

3,956,425

MODIFIER FOR VINYLIDENE CHLORIDE RESIN

Fumiya Nagoshi; Hideyuki Arakawa, and Masaki Matsuo, all of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 8, 1974, Ser. No. 458,479
Claims priority, application Japan, Apr. 10, 1973, 48-41039
Int. Cl.² C08L 31/04; C08F 263/04
U.S. Cl. 260—878 R 5 Claims

1. A modifier for vinylidene chloride resin produced by polymerizing 50 to 20 parts by weight of a vinyl monomer mixture consisting essential of one or more vinyl monomers and at least 20 weight percent aromatic vinyl monomer, in the presence of 50 to 80 parts by weight of a rubber in latex form consisting essentially of ethylene-vinyl acetate copolymer containing 50 to 80 weight percent vinyl acetate.

3,956,426

PROCESS FOR PREPARING BLOCK COPOLYMERS CONTAINING ALPHA-METHYL STYRENE

Herman A. J. Schepers, Stein, Netherlands, assignor to Stamicarbon B.V., Geleen, Netherlands

Filed Sept. 4, 1974, Ser. No. 503,081
Claims priority, application Netherlands, Sept. 6, 1973, 7312245
Int. Cl.² C08F 297/04
U.S. Cl. 260—879 13 Claims

1. In a process for preparing elastomeric block copolymers of the formula A-B-A, wherein:

A is a poly-alpha-methyl-styrene polymer block, and

B is an elastomeric polymer block from a conjugated diene which comprises the steps:

a. polymerizing alpha-methyl-styrene by means of a monofunctional anionic initiator and an activator,

b. polymerizing a conjugated diene into an elastomeric block, forming a bi-block copolymer consisting of a poly-alpha-methyl-styrene block and a polydiene block, and

c. producing a block copolymer of the formula A-B-A by addition of a linking agent to the bi-block copolymer consisting of polymerized alpha-methyl-styrene and conjugated diene, the improvement which comprises

(i) polymerizing the alpha-methyl styrene with an initial monomer concentration in excess of 100 g of alpha-methyl styrene per liter of reaction mixture, at a temperature of between about 0° and 40°C, in the presence of an activator, said activator being present in an amount such that the activator/initiator molar ratio ranges between about 0.1 and 35, and for a polymerization time of less than 120 minutes;

(ii) adding a small amount of conjugated diene and/or styrene to the mixture in (i) and then;

(iii) the conjugated diene is added to the mixture and is polymerized.

3,956,427

BENZYLATED PHOSPHORIC ACID HYDRAZIDES

Andreas Schmidt, Reinach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

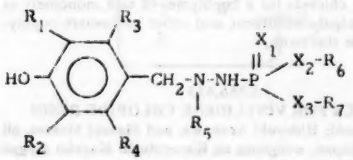
Filed Oct. 21, 1974, Ser. No. 516,228

Claims priority, application Switzerland, Oct. 31, 1973, 15329/73

Int. Cl.² C07F 9/12; C08K 5/53

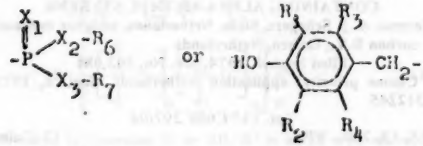
U.S. Cl. 260—923 4 Claims

1. Compounds of the formula

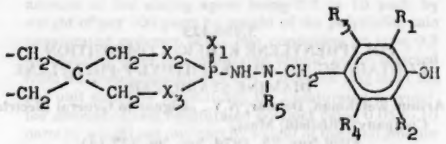


(I)

in which R_1 denotes alkyl having 1–8 carbon atoms, cycloalkyl having 6–8 carbon atoms, or aralkyl having 7–9 carbon atoms; R_2 denotes hydrogen, alkyl having 1–8 carbon atoms, cycloalkyl having 6–8 carbon atoms, or aralkyl having 7–9 carbon atoms, R_3 and R_4 independently of one another denote hydrogen or methyl, R_5 denotes hydrogen or one of the groups



R_6 and R_7 independently of one another denote alkyl having 1–22 carbon atoms, cycloalkyl having 5–8 carbon atoms, halogenoalkyl having 2–18 carbon atoms, thiaalkyl having 3–21 carbon atoms, wherein X_2 and X_3 are linked to a carbon atom in the thiaalkyl radical which does not carry further heteroatoms, oxaalkyl having 3–21 carbon atoms, wherein X_2 and X_3 are linked to a carbon atom in the oxaalkyl radical which does not carry further hetero-atoms, alkenyl having 3–4 carbon atoms, aralkyl having 7–15 carbon atoms, phenyl, alkylphenyl having 7–14 carbon atoms, alkoxyphenyl having 7–14 carbon atoms, chlorophenyl or phenylphenyl, or R_6 and R_7 conjointly denote 1,2- or 1,3-alkylene having 2 to 8 carbon atoms, or o-phenylene, or, if R_5 denotes a phosphorus-free group, also a group



and X_1, X_2 and X_3 independently of one another denote oxygen and/or sulphur, not more than 2 radicals out of X_1, X_2 and X_3 being sulphur.

3,956,428

AMINE PHOSPHITES

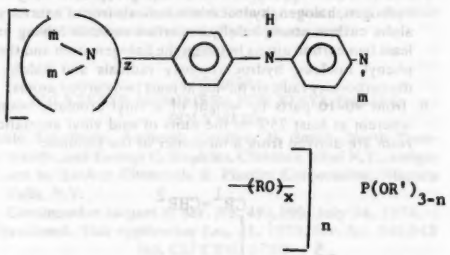
D. Bruce Merrifield, Williamsville; Joseph A. Pawlak, Cheektowaga, and James G. Colson, Williamsville, all of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation of Ser. No. 326,200, Jan. 24, 1973, abandoned. This application June 6, 1975, Ser. No. 584,446

Int. Cl.² C07F 9/141, 9/145

U.S. Cl. 260—929 10 Claims

1. A compound of the formula



wherein

R is selected from the group consisting of ethylene, 1,2 propylene, 1,2 butylene, 2,3 butylene, styrylene and mixtures thereof,

x is an integer from 1 to 12,

R′ is selected from the group consisting of alkyl substituted or unsubstituted phenyl and alkyl of 1 to 18 carbon atoms,

n is an integer from 1 to 3,

each *m* is a member, selected independently from the group consisting of alkyl and cycloalkyl of up to 20 carbon atoms,

$+RO+_x H$ and $\left(+RO+_x\right)_2$,

$P(OR')_{3-n}$, wherein R, R′, *n* and *x* are as above described, and

z is 0 or 1, providing that when *z* is 0,

is hydrogen.

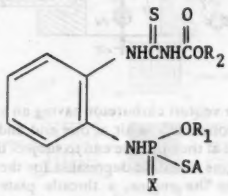
3,956,429

PHOSPHORYL PHENYLENEDIAMINES

Mitsuru Sasaki, Minoo; Kunio Mukai, Amagasaki, and Katsutoshi Tanaka, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Filed July 8, 1974, Ser. No. 486,510
Int. Cl.² C07F 9/24; A01N 9/36; C07D 317/06
U.S. Cl. 260—938 7 Claims

1. A phenylenediamine compound of the formula:



wherein R_1 is a lower alkyl group, R_2 is a lower alkyl group, A is a lower alkyl group, a lower alkenyl group, a lower alkynyl group, a halo(lower)alkyl group, a cyano(lower)alkyl group, a lower alkylthio(lower)alkyl group, a halo(lower-)alkenyl group, a lower alkoxy(lower)alkyl group, a lower alkoxycarbonyl(lower)alkyl group, a lower alkylcarbamoyl(-lower)alkyl group, a phenyl group or a phenyl(lower)alkyl group having one to three substituents on the benzene ring, said substituents being lower alkyl, lower alkoxy, nitro, halogen or lower alkylenedioxy, and X is an oxygen atom or a sulfur atom.

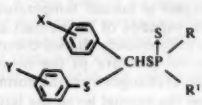
3,956,430

DITHIOPHOSPHATE AND DITHIOPHOSPHONATES

Llewellyn W. Fancher, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Feb. 21, 1975, Ser. No. 550,260
Int. Cl.² C07F 9/165, 9/40; A01N 9/36
U.S. Cl. 260—949 3 Claims

1. A compound having the formula



in which R is alkoxy having 1 to 5 carbon atoms; R^1 is alkyl having 1 to 5 carbon atoms; or alkoxy having 1 to 5 carbon atoms; X is hydrogen, chlorine, bromine, methyl, methoxy, or ethoxy and Y is hydrogen, chlorine, bromine, methyl, methoxy or ethoxy.

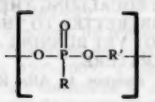
3,956,431

PROCESS FOR FORMING PHOSPHONATE POLYMERS

Milton L. Honig, New York City, and Edward D. Weil, Hastings-on-Hudson, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed June 10, 1974, Ser. No. 477,873
Int. Cl.² C07F 9/141; C08G 79/04
U.S. Cl. 260—971 16 Claims

1. A process for preparing polymers containing the repeating unit



where R is selected from the group consisting of hydrogen and hydrocarbyl and R′ selected from the group consisting of alkylene, substituted alkylene and alkylene groups having at least one O, S, arylene, or vinylene interruption therein which comprises the transalkylation at elevated temperature of a dihalide of the formula

X-R′-X

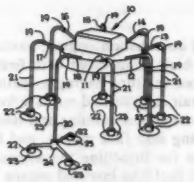
where R′ has the same meaning given above and X is selected from the group consisting of chlorine and bromine and is attached to the terminal carbon atoms in R′, with a phosphonate having the formula $RPO(OR'')_2$ where R is as defined above and R′′ is an alkyl group.

3,956,432

AERATION TECHNOLOGY

David L. Hilling, Bismarck, N. Dak., assignor to Russel E. Logan, Belfield and Terry E. Logan, Medora, both of, N. Dak., part interest to each

Filed Oct. 23, 1973, Ser. No. 408,557
Int. Cl.² B01F 3/04
U.S. Cl. 261—30 50 Claims



1. Apparatus for aerating a liquid, said apparatus when placed in operation being easily serviced from the surface of the liquid, and including:

i a central base structure comprising a source of air under pressure, said base structure being at a level, in relationship to the surface of the liquid, at least as high as a floating relationship on said surface,

ii a plurality of lateral passage means extending radially outward from said source for conducting air outwardly from said source,

iii a diffuser hanger means at substantially the outward end of at least three said passage means, each hanger means being disposed radially outward from said source in spaced relationship to all other said hanger means, and

iv a dependant assembly suspended in hanging relationship downwardly from each said hanger means, each said assembly comprising (a) a downwardly depending flexible air conduit connected in operable air conducting relationship to the outward end of the lateral passage means at the respective hanger means with which a said assembly is associated, (b) an aeration diffuser means fixed substantially in pendant relationship to the lower end of said flexible air conduit in operable connection

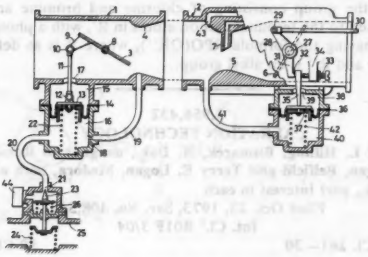
therewith for receiving air therefrom, said aeration diffuser means being adapted to allow escape of air therefrom for upward aeration movement through the liquid, and (c) means for substantially maintaining said aeration diffuser means at a submerged depth within the liquid in said pendant relationship as air is fed thereto from said source.

3,956,433

AUTOMATIC DEVICE FOR EQUALIZING THE ADJUSTMENT OF THE CARBURETTER TO THE OPERATION OF AN ENGINE NOT YET RUNNING AT A STEADY TEMPERATURE

Giampaolo Garcea, Milan, Italy, assignor to Alfa Romeo S.p.A., Milan, Italy

Filed July 29, 1974, Ser. No. 492,913
Claims priority, application Italy, July 30, 1973, 27297/73
Int. Cl.² F02M 1/10
U.S. Cl. 261—39 B 6 Claims



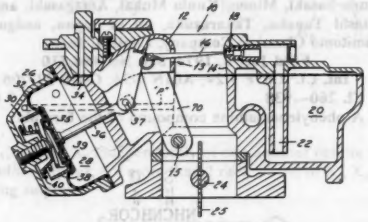
1. In an internal combustion engine, particularly for automotive vehicles, which is provided with first means suitable forming an aspirated mixture having a fuel/air ratio and for regulating the fuel/air ratio of said mixture for the functioning of the engine with the engine running at a steady temperature, an inlet pipe feeding said first means, and further provided with second means for throttling the aspirated air, possibly already mixed with fuel, the last said means being such as to permit regulation of the power output, a device for the automatic correction of said fuel/air ratio to allow the operation of the engine when the engine is not running at a steady temperature, said device comprising third means for throttling the aspirated air, such third means being arranged in the inlet pipe wholly upstream of said first means for forming and regulating the mixture and also wholly upstream of the second means, fourth means for regulating the third means, and a member sensitive to engine temperature, said fourth means being operationally connected to said member which is sensitive to the engine temperature, said fourth means also being responsive to the air flow rate in said inlet pipe and actuating the said third means in such a way that at a given value of said temperature the pressure-drop caused in the aspirated air by said third means comes to have a corresponding value and that such value remains constant against variation of the amount of air aspirated, there thus corresponding to each value of the aforesaid temperature a particular value of said pressure-drop, such pressure-drop being minimal with the engine running at a steady temperature and higher as engine temperature is lower, the correction of the fuel/air ratio with the engine not running at a steady temperature deriving solely from the fact that, downstream of the device the density of the aspirated air is altered, being decreased by the effect of the aforesaid pressure-drop.

3,956,434

CARBURETOR COLD ENRICHMENT FUEL METERING SIGNAL AND AIR FLOW MODULATOR

William E. Dickensheets, Southfield; Robert S. Harrison, Grosse Ile; Max W. Lunsford, Southfield; John D. Medrick, Plymouth; Alvin P. Nowroski, Livonia, and Charles K. Weslock, Harper Woods, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 430,956, Jan. 4, 1974, abandoned.
This application Aug. 21, 1975, Ser. No. 606,829
Int. Cl.² F02M 1/10
U.S. Cl. 261—39 B 4 Claims



1. A variable area venturi carburetor having an air and fuel induction passage connected to air at one end and to an engine intake manifold at the opposite end to subject the passage to the changing engine manifold depression for the induction of air and fuel into the engine, a throttle plate rotatably mounted across the passage for controlling flow through the passage, the induction passage containing a venturi providing a change in velocity and pressure level to fluid flow therethrough, a control pressure sensing port opening into the venturi to subject the port at all times to the pressure depression in the venturi, the venturi including a movable wall movable to vary the venturi flow area, vacuum responsive servo means connected to the movable wall for variably moving the wall to vary the venturi area between a minimum area engine idle speed position and a maximum area engine wide open throttle position, first conduit connecting the pressure port to the servo means for communicating the control pressure level in the venturi to the servo means to move the same and thereby move the movable wall to vary the venturi area in response to opening movement of the throttle plate, second conduit means connected at one end to manifold vacuum in the induction passage below the throttle valve at a location to be traversed by the edge of the throttle valve during opening movement of the throttle valve to subject the second conduit means to progressively lower manifold vacuum force levels, means connecting the opposite end of the second conduit means to the first conduit means between the port and servo means, the first conduit means having a larger flow area than the second conduit means to thereby effect the decay of the level of manifold vacuum force in the second conduit means to the level of the control pressure in the first conduit means whereby the control pressure in the control port alone controls the movement of the servo means during normal operation of the engine at normal temperature levels and thereby alone controls variance of the venturi area during this time, and means to progressively change control of the servo means from the control pressure to the manifold vacuum as the temperature level changes from the normal level to the coldest extreme below the normal level, the latter means comprising temperature responsive valve means movable variably into the first conduit means in response to the attainment of below normal engine operating temperature levels to progressively restrict the communication of control pressure from the port to the servo means as a function of decreasing temperature and thereby progressively switch control of the movement of the servo means and venturi wall from the control pressure in

the venturi to the manifold vacuum in the second conduit means, and means movable in response to temperature changes below the normal engine operating temperature level connected to and moving the temperature responsive valve means.

3,956,435

FLOW GRATE STRUCTURE FOR COOLING TOWERS

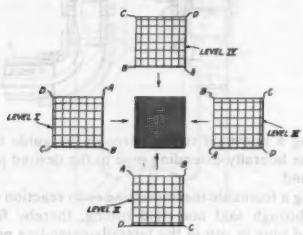
Günther Svensson, Bochum, and Hans-Joachim Wöhler, Bochum-Dahlhausen, both of Germany, assignors to Balcke-Durr Aktiengesellschaft, Ratingen, Germany

Filed Oct. 9, 1974, Ser. No. 513,409

Claims priority, application Germany, Oct. 9, 1973, 2350601

Int. Cl.² F28G *1/02*; F28F *25/08*

U.S. Cl. 261—111 8 Claims



1. A flow grate structure for the direct transfer of heat from a cascading flow of liquid to a counter-flowing stream of gas, adapted, for example, for use in conjunction with water cooling installations in cooling towers, the structure comprising in combination:

at least one stack consisting of four identical flat, horizontal grate units having a rectangular overall outline along which the grate units are vertically aligned; and wherein

each grate unit includes a set of generally vertically oriented longitudinally extending parallel webs, and a similar set of parallel transverse webs intersecting the former so as to define a number of constituent square cell fields, open on their upper and lower sides, for a downward flow of liquid and a counter-flow of gas therethrough;

each grate unit has generally horizontally oriented splash plates arranged above the intersections of its webs;

the longitudinal and transverse webs of each grate unit define a number of said constituent cell fields which together occupy a core field of rectangular outline, located within said rectangular overall outline of the grate unit, while four rectangular border fields, enclosed by longitudinal and transverse webs, occupy the remaining area between said core field and said overall grate unit outline;

the border fields differ from each other in width, the combined width of each of the two pairs of oppositely arranged border fields being equal to 5/4 of the width of a cell field; and

the four grate units in said stack are oriented each differently from the other three, at angular intervals that are multiples of 90°.

3,956,436

PROCESS FOR PRODUCING MICRO-BEADS AND PRODUCT CONTAINING THE SAME

Hidemasa Honda; Yasuhiro Yamada; Hitoo Kakiyama; Takeshi Imamura, and Masanao Nakagawa, all of Tosu, Japan, assignors to Director-General of the Agency of Industrial Science and Technology, Japan

Filed Apr. 5, 1973, Ser. No. 348,224

Claims priority, application Japan, June 29, 1972, 47-65480; June 29, 1972, 47-65481

Int. Cl.² B29C *25/00*; C01B *31/00*; C10M *5/00*, *1/10*

U.S. Cl. 264—29 7 Claims

1. A process for producing from a pitch which forms optically anisotropic micro-spherules when heated in the range of about 350°–500°C a high density isotropic carbonaceous structure constituted of compacted micro-beads comprising the steps of heating said pitch at about 350°–500°C. until said anisotropic spherules form and terminating said heating within said temperature range after about 0.5–6 hours and while said spherules remain in discrete condition, then extracting said heated pitch with an organic solvent of the group consisting of quinoline, pyridine, nitrobenzine, tetrahydrofuran and tar oils, shaping the extracted micro-spherules under pressure into a desired structural shape, and carbonizing the shaped spherules in a non-oxidizing atmosphere.

3,956,437

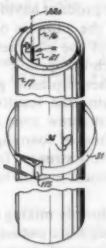
METHOD AND APPARATUS FOR CASTING A CONCRETE COLUMN

Joseph O. Ellis, 3741 Crown Shore Drive, Dallas, Tex. 75234

Continuation-in-part of Ser. No. 379,368, July 16, 1973, abandoned, which is a continuation-in-part of Ser. No. 347,445, April 3, 1973, abandoned, which is a continuation-in-part of Ser. No. 162,573, July 14, 1971, abandoned. This application Nov. 7, 1974, Ser. No. 521,742

Int. Cl.² E04G *13/02*

U.S. Cl. 264—40 19 Claims



1. Column mold apparatus for use in casting concrete columns, said column mold apparatus comprising

a sheet of flexible material having at least one face that may be easily stripped from set-up concrete cast thereagainst, said sheet being of a length such that at least about two complete wraps are provided when said sheet is rolled into columnar configuration to erect a mold form of multi-wraps, said multi-wraps being frictionally engaged one with the other to resist unwrapping of the mold form when concrete is cast therein,

at least one tongue fixed to one side edge of said sheet,

at least one slot formed in said sheet to receive said tongue when said sheet is rolled into columnar configuration, said slot being located on at least one slot line parallel to the sheet's tongued side edge and positioned intermediate the sheet's side edges, the cross-sectional area of the mold form being determined by the distance between the slot line and the sheet's tongued edge when the sheet is rolled into the multi-wrap mold form,

at least one tension band associated with said sheet, said band being of a length that allows it to be positionable at least temporarily about the entire exterior periphery of said multi-wrap mold form, and

tightening means cooperatively engageable with said band to draw said band tight about the external periphery of said multi-wrap mold form for defining the desired cross-sectional area of said mold form by forcing said tongue into a full seated relation with said slot and by substantially removing any slack between said multi-wraps.

3,956,438

PROCESS FOR EXTRUDING A PARTIALLY FOAMED THERMOPLASTIC PRODUCT

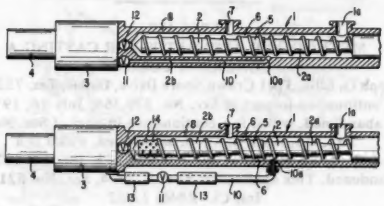
Heinz Schippers, Remscheid, Germany, assignor to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

Division of Ser. No. 229,074, Feb. 24, 1972. This application Oct. 9, 1973, Ser. No. 404,482

Claims priority, application Germany, Feb. 25, 1971, 2108936

Int. Cl.[2] B29D *27/00*; B29F *3/02*

U.S. Cl. 264—46.1 **3 Claims**



1. In a process for the production of a partially foamed thermoplastic polymer product having a core and shell layered structure by means of the addition of a foaming agent during continuous extrusion of the polymer with a screw extruder, the improvement which comprises:

first melting said thermoplastic polymer free of foaming agent and conveying the resulting melt under compression through a first screw zone of the extruder;

dividing said melt free of foaming agent into at least two separate partial melt streams for individual conveyance from said first extrusion zone into a die shaping zone of the extruder;

introducing and uniformly mixing the foaming agent into at least one of said separate partial melt streams in a second screw zone of the same extruder while maintaining at least one other of said separate partial melt streams free of said foaming agent during conveyance to said die shaping zone; and

recombining the individual melt streams in said die shaping zone while expanding said foaming agent to form abutting foamed and non-foamed extruded layers of the core and shell structure.

3,956,439

METHOD AND APPARATUS FOR PLACING FOAMED PLUGS

William B. Hansel, Media, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Nov. 20, 1974, Ser. No. 525,332

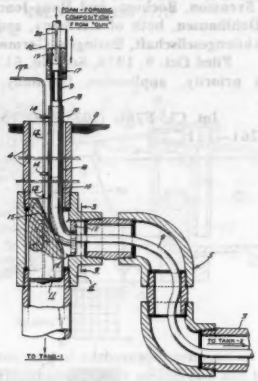
Int. Cl.[2] B29D *27/04*; F16L *55/10*

U.S. Cl. 264—46.6 **6 Claims**

1. A method of plugging an underground laterally-extending pipe connected to a tee fitting on a vertical pipe in which the laterally-extending pipe is accessible only through the top of said vertical pipe, comprising:

a. passing a rigid guide tube, having an elbow on its lower end, into the vertical pipe and down to the point where the end of the elbow of the rigid guide tube is level with the tee fitting to which the laterally-extending pipe is connected;

b. wedging the guide tube within the vertical pipe by pulling a wedge block from below the elbow, upwards between the elbow and the side of vertical pipe, so that the elbow on the guide tube is wedged in the tee fitting;



c. feeding a non-rigid tubing through the guide tube, and into the laterally-extending pipe to the desired plug location; and

d. feeding a foamable thermosetting resin reaction composition through said non-rigid tubing, thereby forming a foamed plug in situ in the laterally-extending pipe at the end of the non-rigid tubing.

3,956,440

PRODUCTION OF FINE GRAINED FERRITE BODIES

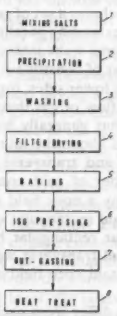
André Deschamps, and Georges Faye, both of Paris Cedex, France, assignors to Societe Lignes Telegraphiques et Telephoniques, Paris Cedex, France

Filed Jan. 23, 1973, Ser. No. 326,022

Claims priority, application France, Feb. 15, 1972, 72.04921

Int. Cl. C01g *49/08*; C04b *35/40*

U.S. Cl. 264—56 **5 Claims**



1. A process for the production of shaped bodies of fine grained ferrimagnetic material which comprises in combination the steps:

preparing a stoichiometeric suspension of salts selected from the group consisting of nitrates and chlorides corre-

sponding to the ferrimagnetic material chemical formulation in alcohol,

coprecipitating said salts in alcoholic suspension as metal hydroxides by addition thereto of a base,

recovering and drying the resulting coprecipitate,

baking the dried coprecipitate in air at about 700°C for about 2 hours,

isostatically pressing the baked coprecipitate into a solid desired shaped body under a pressure between 10^8 and 10^9 Pascal,

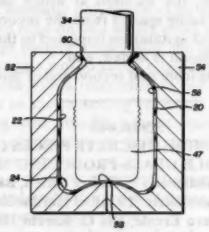
sintering said shaped body under a vacuum of about 10^{-5} mm/Hg for about 3 to less than 4 hours at a temperature about 1200°C to 1400°C.

3,956,441

METHOD OF MAKING A BLOWN BOTTLE HAVING A RIBBED INTERIOR SURFACE

Albert R. Uhlig, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Sept. 16, 1974, Ser. No. 505,966
Int. Cl.² B29C *17/07*
U.S. Cl. 264—89 **8 Claims**



1. The method of varying the wall thickness of a blown plastic article, comprising:

1. blowing a parison interiorly of a first blow mold cavity to a blown pre-form having a blown body portion surmounted by a neck, the blow mold cavity having concave grooves in a portion thereof corresponding to the blown body portion of the pre-form, the blown body portion having a plurality of convex exterior bulbous ribs located on a portion of the periphery thereof at the pre-form portions corresponding to the locations of greatest desired strength on the blown body portion of the final article, said bulbous ribs being formed by expansion of the parison into the concave grooves; and then

2. in a single blowing step, blowing the pre-form interiorly of a final blow mold, expanding the ribbed portions of the blown pre-form body to a lesser extent that the non-ribbed portion, and forming a blown plastic article having a smooth exterior surface and a ribbed interior surface in the region corresponding to the ribbed portion of the pre-form.

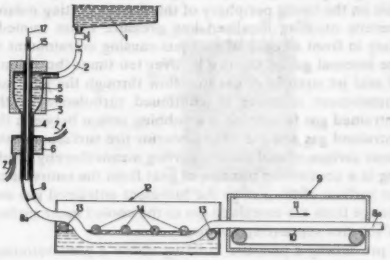
3,956,442

PROCESS OF CONTINUOUS FABRICATION OF ELASTOMER OR PLASTOMER TUBES FROM AQUEOUS DISPERSIONS

Robert Georges Pierre Boulain, 1, Avenue Gabrielle, 94100 Saint-Maur, France

Filed May 29, 1974, Ser. No. 474,461
Int. Cl.² B29H *7/14, 15/00*
U.S. Cl. 264—95 **9 Claims**

1. In the process of fabrication of elastomer or plastomer tubes from a sensitized aqueous disperson, wherein the dispersion is passed from a supply chamber of an extruder through a shaping device in the form of two concentric tubular conduits extending downwardly from said supply chamber with the dispersion passing between said tubular conduits and means below said supply chamber supplying heat to the dispersion passing between said tubular conduits to initiate gelling thereof prior to its being discharged from said shaping device, the improvement comprising providing a third tubular conduit passing through said supply chamber and extending coaxially through and thermally insulated from said two concentric conduits and terminating at its lower end at substantially the same level as said two concentric conduits, and continuously supplying heated compressed air through said third conduit and into the partially gelled tube substantially as it is discharged from between said two concentric conduits, said heated compressed air being supplied at a rate to produce a flow of air through the partially gelled tube to accelerate the final gelling process and being heated to a temperature to promote evaporation of aqueous serum exuded from the inner surface of the tube being formed.

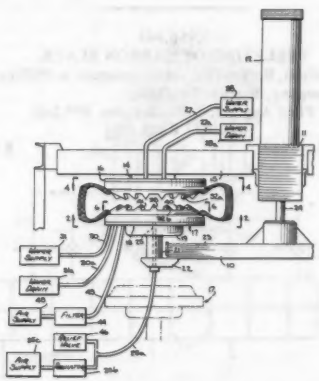


3,956,443

METHOD FOR COOLING TIRES DURING POST-INFLATION

Daniel Shichman, Trumbull, Conn., assignor to Uniroyal Inc., New York, N.Y.

Division of Ser. No. 382,972, July 26, 1973, Pat. No. 3,852,008. This application July 3, 1974, Ser. No. 485,664
Int. Cl.² B29C *25/00*
U.S. Cl. 264—100 **1 Claim**



1. The method of post-mold cycle cooling a pneumatic tire after removal of the tire from the mold and during the course of a post-inflation treatment, comprising:

supporting the tire to be cooled on a tire-supporting means having an interior chamber for circulating a cooling liquid therein;

inflating the tire to a predetermined inflation pressure with a gas;

supplying a controlled flow of cooling liquid through said chamber sufficient to maintain the inner surface of the tire-supporting means at or below ambient temperature during the post-inflation cycle;

thereafter, during said post-inflation cycle, injecting continuously controlled jet streams of gas into the inflated tire through a plurality of aspirator jets located at equal intervals on the inside periphery of the tire-supporting means, thereby creating localized low pressure zones immediately in front of each of said jets causing entrainment of the internal gas of the tire by over ten times the volume of said jet streams of gas that flow through the jets, said entrainment resulting in continued turbulence of the entrained gas to provide a scrubbing action between the entrained gas and the entire interior tire surface and the inner surface of said tire-supporting means thereby resulting in a continuous transfer of heat from the entire interior surface of the tire to the turbulent entrained gas and thence from the entrained gas to the cooled inner surface of the tire-supporting means;

and preventing a pressure build-up above a predetermined value inside the tire.

3,956,444

PROCESS FOR PRODUCING A RAPIDLY-SOLUBLE SODIUM DICHLOROISOCYANURATE DIHYDRATE TABLET

William Henry Kibbel, Jr., Pennington, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Aug. 6, 1973, Ser. No. 385,907

Int. Cl.² A61J *3/10*; B29B *1/032*

U.S. Cl. 264—109 **2 Claims**

1. A process for producing a rapidly-soluble, structurally-strong, storage-stable tablet of sodium dichloroisocyanurate dihydrate which comprises placing a particulate material consisting essentially of sodium dichloroisocyanurate dihydrate into a structure forming apparatus, compressing the sodium dichloroisocyanurate dihydrate with a compression pressure of about 2,000 to about 10,000 p.s.i., and recovering a rapidly-soluble, structurally-strong, storage-stable tablet which is resistant to deterioration and dimensional change due to moisture.

3,956,445

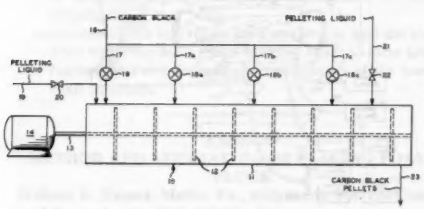
PELLETING OF CARBON BLACK

Harold R. Hunt, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 21, 1974, Ser. No. 499,148

Int. Cl.² B01J *2/12*

U.S. Cl. 264—117 **8 Claims**



1. The method of pelleting carbon black which comprises:

a. introducing an aqueous pelleting liquid and loose carbon black in the weight ratio of about 2:3 to 2:1 into one end of an elongated continuous pellet mill having rotating agitating means therein which extend between the opposite ends of the pellet mill;

b. rotating said agitating means to mix said liquid and carbon black to form pellets and to move said pellets toward the end of said pellet mill opposite said one end;

c. introducing additional loose carbon black into said pellet mill through a plurality of conduit means spaced along the length of said pellet mill such that the average residence time of pellets in the mill between said one end and the first conduit means and between adjacent conduit means is at least one minute, the amount of carbon black added through each of said conduit means being about 10 to 50 percent by weight of the carbon black introduced into said one end of the mill and the total amount of carbon black added through said conduit means being in the range of about 50 percent to 150 percent by weight of the carbon black added at said one end, and the total amount of carbon black added through said conduit means being such that the resulting pellets have a moisture content of at least about 30 percent by weight;

d. introducing additional aqueous pelleting liquid into said pellet mill between the last conduit means and the second end of the pellet mill, the amount of additional liquid so added being in the range of about 5 to 50 percent by weight of the amount of liquid introduced into said one end of the mill, the location at which said additional liquid is added being spaced from the second end of said pellet mill so that agitation is imparted to the pellets after the additional liquid is added; and

e. removing pellets from said second end of said pellet mill.

3,956,446

METHOD OF FORMING DISCRETE PIECES OR PELLETS FROM MELTABLE GLASS-PRODUCING MIXTURES

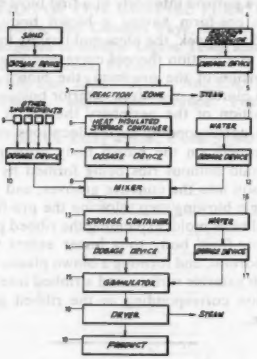
Paul Eirich, Bahnhofstrasse 19; Walter Eirich, Bahnhofstr. 19; Hubert Eirich, Bahnhofstr. 19, all of Hardheim, Nordbaden, Germany, and Piero Ercole, Via G. Roreto 10, Asti, Italy

Filed May 20, 1974, Ser. No. 471,584

Claims priority, application Switzerland, May 30, 1973, 7862/73

Int. Cl.² B01J *2/16*; C03C *1/02*, *3/04*

U.S. Cl. 264—117 **28 Claims**



1. In a method of forming discrete pieces or pellets from a glass-producing meltable mixture, wherein the glass-producing mixture comprises sand grains and a sodium-containing component which at least partially consists of aqueous sodium hydroxide, the improvement which comprises that the sand grains are reacted at a temperature between about 200° to 450°C for from about 5 minutes to 2 hours with the aqueous sodium hydroxide without direct contact with CO_2, thereby to form a surface layer of water soluble silicates on the sand grains, thereafter subjecting the sand grains to a mechanical treatment in order to at least partially remove the water soluble silicates from the sand grains and thereby reducing the size

of the sand grains, adding the remaining ingredients of the glass-producing mixture to the sand grains and the water soluble silicates, mixing the mixture to form a uniform mass and then agglomerating the mass in the presence of 5–15 percent by weight of water, the final pellets being non-hygroscopic and constituting an eutectic mixture and possessing good stability on prolonged storage.

3,956,447

METHOD OF MAKING DEEP DRAWN, LAMINATED ARTICLES

Maurice R. Denommee, Franklin; Jack F. Furrer, Wayland; Lawrence R. McManus, Lynn, and Philip E. Durand, Hudson, all of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 16, 1975, Ser. No. 587,517
Int. Cl.² B29D *9/10*
U.S. Cl. 264—135 **12 Claims**

1. Method of making a deep drawn, laminated article having a smooth edge, said article formed of a plurality of laminae of woven fabric composed of aromatic polyamide yarns impregnated with sufficient resin to cause said laminae to adhere together, said aromatic polyamide yarns having a tendency to form a stubbled edge on said article when trimmed to form the peripheral edge thereof, comprising the steps of:

a. impregnating a woven fabric composed of aromatic polyamide yarns with a resin mixture comprising a first thermoplastic or thermosetting resin and a volatile solvent,

b. removing said volatile solvent from the impregnated fabric by evaporation to form a resin-impregnated and solvent-free fabric,

c. preparing a plurality of preform patterns from said resin-impregnated and solvent-free fabric, said patterns being cut in a generally star shape,

d. superimposing said plurality of preform patterns on each other, said patterns being overlapped sufficiently to provide an effective number of thickness of said resin-impregnated and solvent-free fabric greater than the actual number of patterns in the final molded article over a large portion of said article,

e. tacking said plurality of preform patterns together in overlapping stage,

f. placing the tacked superimposed patterns on the male element of a deep draw compression mold,

g. deep draw molding said tacked superimposed patterns with the assistance of the female element of said mold and low heat and pressure to produce a deep drawn preform having a preliminary edge,

h. removing said deep drawn preform from said mold,

i. applying a second resin along that portion of said preform which is to comprise the peripheral edge of the preform, said second resin being thermoplastic or thermosetting and in a sufficient quantity and having rheological characteristics at the temperature and pressure at which finish molding is carried out which cause said second resin to flow over and about said peripheral edge of said preform, and

j. finish molding said deep drawn preform to produce said article with a smooth finish peripheral edge formed thereon by said second resin.

3,956,448

METHOD OF CENTRIFUGALLY CASTING A TIRE

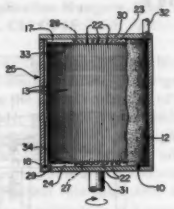
William M. Larson, Hudson, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 21, 1974, Ser. No. 516,511
Int. Cl.² B29C *5/04;* **B29H** *9/02, 17/00*
U.S. Cl. 264—138 **9 Claims**

1. A method of casting a tire, comprising the steps of:

a. securing a single, cylindrical layer of tire reinforcement cords to a mandrel between opposing, parallel, circular plates of the mandrel, the cords of the layer being held parallel to the longitudinal axis of the mandrel and fastened to the plates in equally spaced relation around the outer periphery of the plates;

b. placing the mandrel, with the layer of parallel cords, within a mold having a rigid, cylindrical inner surface such that the tire cords are spaced from the surface;



c. while holding said cords parallel, causing tire forming material to flow into the mold in contact with the inner surface thereof and around the tire cords while rotating the mold to form a cylindrically shaped uncured tire; and

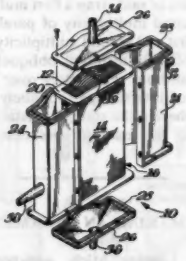
d. curing the tire forming material to form a cylindrically shaped tire within the mold.

3,956,449

FLAT PLATE DIALYZER AND METHOD OF MAKING SAME

Melvin Wexler, 3207 Hayes Road, Norristown, Pa. 19403, and John J. Vey, 909 Limekiln Pike, Maple Glen, Pa. 19002

Filed Mar. 18, 1975, Ser. No. 559,413
Int. Cl.² B01D *31/00*
U.S. Cl. 264—139 **5 Claims**

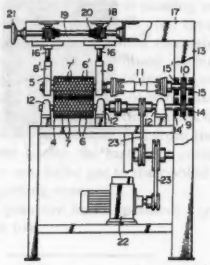


1. A method of making a flat plate dialyzer comprising the steps of aligning lengths of tubular membrane material and support material in a curved stacked array, applying sealing material to the ends of the curved array, removing at least a portion of the sealing material, and rotating the edges of the curved array toward a level plane to open up the tubular membrane material.

3,956,450
BINDING STRAP, AND PROCESS FOR MANUFACTURING SAME

Morio Abe, Tokyo, and Masaaki Kaji, Chofu, both of Japan, assignors to Dainippon Ink and Chemicals, Incorporated, Tokyo, Japan

Filed Apr. 4, 1972, Ser. No. 241,018
Claims priority, application Japan, July 19, 1971, 46-53119
Int. Cl.² B29D *15/00*
U.S. Cl. 264—210 R **1 Claim**



1. In the process for the manufacture of a binding strap including the steps of extrusion molding a narrow and flat band from a starting material consisting predominantly of a thermoplastic synthetic resin having good crystal orientating tendency, cooling the extruded band, stretching the band to a high degree in the extrusion direction, and thereafter forming concavities and convexities in the front and back sides of the band by means of a set of pressure rolls having surfaces engraved with concavities and convexities, the improvement which comprises engraving in relief each of the pressure rolls with a first multiplicity of parallel ridges and a second multiplicity of parallel ridges, said first and second multiplicity of parallel ridges being intersectingly disposed obliquely with respect to each other, setting up said pressure rolls so that the first and second multiplicity of parallel ridges are constantly in register with the first and second multiplicity of parallel ridges of each other roll, and compressing the band with said rolls in such a manner that the width of the band is not increased in excess of 10%, thereby forming in register at the front and back sides of said strap a first multiplicity of parallel grooves and a second multiplicity of parallel grooves corresponding to said first and second multiplicity of parallel ridges, which are intersectingly disposed obliquely with respect to each other, to distribute reticulately over the whole of said strap a plurality of intersecting, obliquely disposed parallel groove portions wherein the state of crystal orientation in said groove portions in the machine direction of said strap has been reduced.

3,956,451
METHOD OF MAKING AN ORNAMENTAL STYLED WHEEL

Leslie R. Adams, Lansing, Mich., assignor to Motor Wheel Corporation, Lansing, Mich.

Division of Ser. No. 189,116, Oct. 14, 1971, Pat. No. 3,762,677, which is a continuation-in-part of Ser. No. 857,960, Sept. 15, 1969, abandoned. This application June 29, 1973, Ser. No. 375,134
Int. Cl.² B29D *27/04*
U.S. Cl. 264—45.5 **13 Claims**

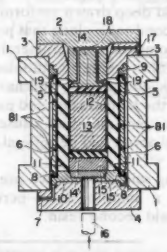
1. A method of making an ornamental styled wheel for automotive passenger vehicles and the like comprising the steps of:

1. providing a metal wheel disc and a metal tire-receiving rim subassembly operable as a street wheel when a tire is mounted on said rim;
2. providing a mold part having an annular lip adapted to seat against an annular portion of the outboard face of said subassembly radially outwardly of the center of the disc, the mold part having a surface contoured to provide an ornamental configuration for the outboard side of said wheel and adapted to define with at least part of the outboard face of said subassembly a mold cavity axially adjacent the outboard face thereof;
3. placing said wheel subassembly against said mold part with said annular portion of the outboard face of said subassembly in sealing engagement with the annular lip portion of said mold part;
4. orienting said subassembly and mold part with their axes upright and said mold part beneath said subassembly whereby said subassembly serves as the lid for said mold cavity;
5. molding an elastomeric material in said mold cavity while said mold part and subassembly are so oriented by generally filling the cavity with said material in the form of a urethane reaction mixture in liquid form, and including a small percentage of a blowing agent which blows in said mold cavity causing generation of gas bubbles which permeate said material and also migrate upwardly therein toward said subassembly by gravitational displacement prior to solidification of said reaction mixture and allowing the same to solidify and form a microcellular elastomeric structure adhered to said part of said outboard face of said subassembly exposed to said cavity with the highest density portion thereof disposed farthest from said outboard face of said subassembly;
6. and thereafter removing from said mold part said rim and disc subassembly with said elastomeric material solidified and permanently adhered to said subassembly and exposed to view on the outboard side of said wheel whereby said material provides a homogeneous decorative body permanently attached to said rim and disc subassembly and forming a water resistant and corrosion resistant covering for the portion of said outboard face to which said body is adhered.

3,956,452
DRY-TYPE ISOSTATIC PRESSING METHOD INVOLVING MINIMIZATION OF BREAKS OR CRACKS IN THE MOLDED BODIES

Shinroku Saito, Yokohama, Japan, assignor to Shinagawa Firebrick, Co., Ltd., Tokyo, Japan

Filed Aug. 16, 1973, Ser. No. 389,053
Int. Cl.² B28B *3/00*, *7/32*; B29C *6/00*
U.S. Cl. 264—89 **5 Claims**



1. In a dry-type isostatic pressing method wherein powders are formed into a molded body by housing said powders in the interior of a shaping rubber mold, applying isostatic pressure to said rubber mold to compress said powders and form said molded body, and rapidly decreasing and finally removing said isostatic pressure to decompress said rubber mold and restore it to its original state, the improvement comprising introducing gas under pressure between the outer peripheral surface of said molded body and the inner peripheral surface of said

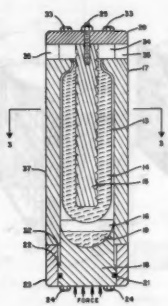
shaping rubber mold during said decompression step, said gas under pressure being introduced as a sheet of fluid which sheet is parallel to said outer peripheral surface and over the entire surface area of said outer peripheral surface, and said pressure being higher than said isostatic pressure at the time when said shaping rubber mold begins to restore to its original state.

3,956,453

PROCESS FOR FABRICATING ONE-PIECE ROCKET MOTOR HEAT BARRIER

Leroy M. Stayton; William H. Thielbahr, and James C. Connelly, all of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 3, 1973, Ser. No. 421,307
Int. Cl.² B29C *1/08*; B29D *1/00*; B29G *3/00*
U.S. Cl. 264—219 **3 Claims**



1. A method of making a molded, contoured seamless structure comprising the steps of:

forming an integral male mold member by casting a low melting alloy around a high melting alloy core to form an external surface area that defines the internal shape of said structure;

fabricating a female mold member whose internal surface defines an external surface area of said structure, said female mold member having a removable reservoir formed with a cuplike depression at one end of said female member and overflow holes at its other end;

assembling said male and female members together to form a mold assembly with a spaced distance from one another to define the wall thickness of said structure;

placing a fluid curable, castable material in said removable reservoir; attaching said removable reservoir to the end of said female mold member;

applying a force to move said removable reservoir along the longitudinal axis of said mold assembly to cause said fluid castable material to flow into interstices between said male and female members with excess fluid castable material flowing out said overflow holes; allowing said material to cure;

supplying heat to said mold assembly until a substantial amount of said low melting alloy melts to allow loosening of said structure thus permitting removal of said high melting alloy core; and

disassemblying said mold assembly to remove said structure.

3,956,454

PROCESS FOR PRODUCING ALUMINUM TRICHLORIDE

Erno Nemecz, Budapest; Aurel Ujhidy, Veszprem; Oszkar Borlai; Karoly Polinszky, both of Budapest; Janos Szepvolgyi, Veszprem; Tamas Szekely, Budapest; Laszlone Szabo, Tatabanya, and Szilard Riederauer, Budapest, all of Hungary, assignors to Toth Aluminum Corporation, New Orleans, La.

Filed Nov. 16, 1973, Ser. No. 416,676
Claims priority, application Hungary, Sept. 28, 1973, 14980
Int. Cl.² C01F *7/56, 7/60*
U.S. Cl. 423—136 **6 Claims**

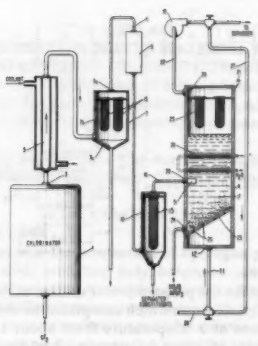
1. A process for producing aluminum trichloride comprising the steps of: comminuting separately or together aluminous material selected from the group consisting of kaolin, illite and bauxite and low-grade sub-bituminous reductant selected from the group consisting of brown coal, lignite and coke, to a size range of from 2–200 μ diameter; admixing the two materials with an effective amount of sodium chloride up to 5% to increase the reaction rate and yield of aluminum trichloride; compacting said admixture at a pressure of an effective amount up to 15 t/cm² to form an extremely close and intimate mixture in the shape of tablets or briquets; crushing the tablets or briquets; calcining said crushed intimate mixture at a temperature of from 650°–900°C; and chlorinating the calcined intimate mixture at a temperature of from 700°–1000°C with a gaseous stream containing chlorine for from ¼ to 4 hours to form aluminum trichloride.

3,956,455

RECOVERY OF SOLID SELECTIVELY CONSTITUTED HIGH PURITY ALUMINUM CHLORIDE FROM HOT GASEOUS EFFLUENT

Larry K. King; Lester L. Knapp, both of Maryville, Tenn.; Ronald C. Schoener, Lower Burrell, Pa.; Nicholas Kloap, Benton, Ark.; Bernard M. Starner, Rockdale, Tex., and John A. Remper, Lower Burrell, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 180,276, Sept. 14, 1971, Pat. No. 3,786,135. This application Jan. 11, 1974, Ser. No. 432,443
The portion of the term of this patent subsequent to Jan. 15, 1991, has been disclaimed.
Int. Cl.² C01F *7/58, 7/60, 7/62*
U.S. Cl. 423—136 **10 Claims**



1. In the production of aluminum chloride by the chlorination of sodium contaminated alumina, a process for selectively recovering high purity aluminum chloride from the hot gaseous effluent thereof containing volatilized aluminum chloride values, gaseous carbon oxides, aluminum oxychloride values,

volatilized sodium aluminum chloride values and entrained solid particles of alumina and carbon, comprising the steps of cooling said hot gaseous effluent to a predetermined temperature below the chlorination reaction temperature and above the ambient condition condensation temperature of aluminum chloride effective to selectively condense sodium aluminum chloride values therein intermediate two stages of filtration, at least one of which effects the separation of condensed sodium aluminum chloride values from said gaseous effluent, condensing high purity aluminum chloride values from such effluent at a second predetermined temperature below the ambient condition condensation temperature of aluminum chloride.

3,956,456

GYPSUM CALCINATION

Joseph A. Keller, Williamsville, and Robert T. Spitz, Elma, both of N.Y., assignors to National Gypsum Company, Buffalo, N.Y.

Filed Dec. 17, 1971, Ser. No. 209,242
Int. Cl.² C04B *11/02*
U.S. Cl. 423—171 **8 Claims**

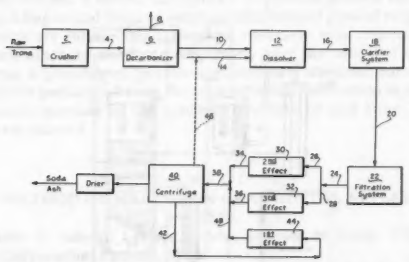
1. The method of continuously converting calcium sulfate dihydrate to settable cementitious calcium sulfate hemihydrate comprising the steps of continuously feeding finely ground gypsum to a peripherally confined cylindrical heating zone, conveying said gypsum through said heating zone by means of heated gases moving, with a rotary motion, therethrough, said heated gases being introduced into said heating zone in paths substantially tangential to and adjacent to the cylindrical periphery of said heating zones at a velocity sufficient to propel said ground gypsum spirally through the length of said cylindrical heating zone, and heating said gypsum with said heated gases to a temperature sufficient to drive off a portion of the chemically combined water therein, said heating of said gypsum forming calcium sulfate hemi-hydrate.

3,956,457

PREPARATION OF SODIUM CARBONATE MONOHYDRATE

Eugene Baker Port, Solvay, and Carlton James Howard, Salina, both of N.Y., assignors to Allied Chemical Corporation, New York, N.Y.

Division of Ser. No. 757,511, Sept. 4, 1968, Pat. No. 3,653,848. This application Oct. 7, 1971, Ser. No. 187,578
Int. Cl.² C01D *7/24*, *7/40*
U.S. Cl. 423—206 T **8 Claims**



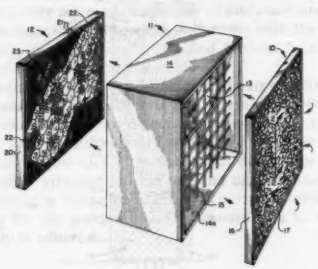
1. A process for the preparation of sodium carbonate monohydrate from crude trona which comprises the steps of heating said crude trona at a temperature from about 150° to about 500°C. sufficient to effect conversion of said trona to crude sodium carbonate, dissolving the crude sodium carbonate in an aqueous solution and clarifying and filtering said aqueous solution to remove insoluble material to form a carbonate process solution consisting essentially of a substantially saturated aqueous solution of sodium carbonate containing about 10 to 1000 parts per million of soluble organic impurities, basis sodium carbonate, evaporating a portion of the aqueous phase of said solution in a first crystallization conducted at a temperature and under crystallization conditions sufficient to form sodium carbonate monohydrate crystals as the stable crystal phase in a mother liquor, separating said monohydrate crystals from said mother liquor, subjecting said mother liquor containing a higher concentration of said soluble organic impurities than said carbonate process solution to a second crystallization conducted at a temperature higher than the temperature maintained during said first crystallization sufficient to evaporate a portion of the aqueous phase of said mother liquor to form a stable crystal phase of sodium carbonate monohydrate crystals and separating said crystals from a mother liquor having an organics level higher than said carbonate process solution and said mother liquor separated from said first crystallization.

3,956,458

METHOD AND APPARATUS FOR AIR PURIFICATION

Paul Brent Anderson, 744 W. 1950 South, Woods Cross, Utah 84087

Filed Nov. 16, 1973, Ser. No. 416,409
Int. Cl.² B01D *53/34*
U.S. Cl. 423—210 **1 Claim**



1. A method of removing mercury vapor from the atmosphere comprising

moving the air containing the mercury vapor through a filter of sulfur coated fibers to remove at least part of the mercury vapor from the air;

moving the air passed through the filter of sulfur coated fibers through an electronic precipitator having an anode through which the air is passed and a cathode on which mercury anions will amalgamate to further remove part of any remaining mercury vapor from the air; and

moving the air passed through the electronic precipitator through an iodine impregnated, activated charcoal filter such that any sulfur and sulfur compounds in the air resulting from passage of the air through the filter of sulfur coated fibers and remaining mercury vapor carried by the air are at least partially removed by intimate contact with the iodine impregnated charcoal of the filter.

3,956,459

PROCESS FOR THE ELIMINATION OF POLLUTANTS IN EXHAUST GASES

Robert Henry Whitman, Stamford, Conn., and Edward Leyman, New Rochelle, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 254,590, May 18, 1972, Pat. No. 3,819,533. This application Jan. 28, 1974, Ser. No. 437,437
Int. Cl.² B01D *53/34*
U.S. Cl. 423—213.5 **1 Claim**

1. A process for treating exhaust gases from internal combustion engines to oxidize the air pollutants therein which comprises contacting said gases with catalyst material consisting essentially of an alumina support stabilized against exces-

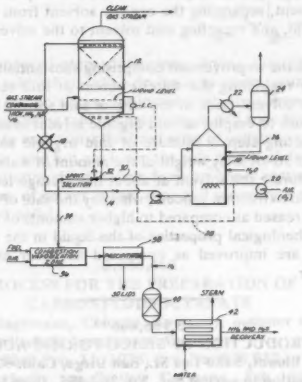
sive shrinkage by treatment with an alkaline earth metal compound and calcination at 1800°F., said support uniformly impregnated with from about 2 to 10 weight percent of cupric oxide and from about 2 to 10 weight percent of chromic oxide as a first promoter level and thereover from about 0.0025 to 0.1 weight percent of palladium as a second promoter level, said percentages being based on the weight of the stabilized support.

3,956,460

PROCESS FOR THE TREATMENT OF GAS STREAMS CONTAINING HYDROGEN CYANIDE

Jack Brocoff, Fullerton, Calif., assignor to Ralph M. Parsons Company, Pasadena, Calif.

Filed Nov. 5, 1973, Ser. No. 412,953
Int. Cl.² B01D *53/34*
U.S. Cl. 423—221 **12 Claims**



1. A process for the removal of ammonia, hydrogen cyanide and hydrogen sulfide contained in gas streams which comprises:

a. contacting the gas stream with an aqueous oxygen containing absorption solution in which thiocyanate ion is present in an amount of from about 95 to about 140 grams per liter; thiosulfate ion in an amount up to 20 grams per liter; sulfite ion in an amount up to 0.5 grams per liter; ammonia in an amount of from about 20 to about 55 grams per liter; sulfur in an amount up to about 55 grams per liter and free oxygen in an amount up to solution saturation for a time sufficient for the ammonia, hydrogen cyanide and hydrogen sulfide to react with the contained oxygen to form an aqueous solution containing ammonium thiocyanate, and a gas stream essentially free of hydrogen cyanide and substantially reduced in ammonia and hydrogen sulfide content; and

b. disposing of at least a portion of the aqueous ammonium thiocyanate containing solution by:

i. admixing at least a portion of the ammonium thiocyanate containing solution with the products of combustion of an organic fuel with an oxygen containing gas to form a resultant gas stream at a temperature of at least about 700°F comprising water, hydrogen cyanide, and hydrogen sulfide formed at least as a result of thermal decomposition of ammonium thiocyanate;

ii. contacting the resultant gas stream with a supported catalyst which contains at least one metal selected from Group Va, Group VIa, the third period of Group VIII, and the Rare Earth Series of the Periodic Table for a time sufficient to at least hydrolyze the contained hydrogen cyanide to form a residual gas stream containing hydrogen sulfide and a nitrogen compound selected from the group consisting of ammonia, nitrogen and mixtures thereof;

iii. treating the residual gas stream to remove contained ammonia and hydrogen sulfide.

3,956,461

ORTHORHOMBIC RARE EARTH Hf AND Zr SULFIDES AND SELENIDES

Paul Christopher Donohue, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 31, 1974, Ser. No. 476,133
Int. Cl.² C01F *17/00*
U.S. Cl. 423—263 **6 Claims**

1. Solid compositions of the formula

$$M_2M'X_5$$

where

1. M is one or more element selected from the group consisting of the rare earths of atomic numbers 57—71 and yttrium, but excluding europium and ytterbium,
2. M′ is one or more of zirconium and hafnium, and
3. X is sulfur or selenium, with the proviso that when X is selenium, the compound is

a. of the formula

$$M_2''ZrSe_5$$

where M″ is one or more element selected from the group consisting of the rare earths of atomic numbers 57–65 except europium, or

b. of the formula

$$M_2'''HfSe_5$$

where M‴ is one or more rare earth of atomic number 57–59,

said compositions being characterized by orthorhombic crystal structure consistent with space groups Pnam or $Pna2_1$.

3,956,462

PROCESS UTILIZING WASTE MATERIAL CONSISTING SUBSTANTIALLY OF PHOSPHOROUS ACID

Gero Heymer, Erftstadt Liblar; Wolfgang Scheibitz, Leverkusen, and Hasso Spott, Turnich-Balkhausen, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Mar. 18, 1974, Ser. No. 451,911
Claims priority, application Germany, Mar. 22, 1973, 2314232
Int. Cl.² C01B *25/00*
U.S. Cl. 423—299 **14 Claims**

1. A process for the production of hydrogen phosphide and phosphoric acid, including polyphosphoric acid, comprising the steps of introducing waste phosphorous acid contaminated with substantially organic compounds, with agitation, into a liquid phase so as to maintain a ratio by volume of liquid phase to phosphorous acid between 1:1 and 10:1, the liquid phase being placed in a reactor, being maintained at temperatures between 250° and 400°C and being selected from at least one phosphoric acid of the general formula $H_{n+2}P_nO_{3n+1}$, in which n substantially stands for a number between 1 and 5 removing and recovering the resulting hydrogen phosphide and recovering the newly formed liquid phase containing phosphoric acid from the reactor.

3,956,463

PRODUCTION OF PHOSPHORUS OXYHALIDE

B. Meredith Winn, Jr., Richmond, Va., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 2, 1975, Ser. No. 564,399

Int. Cl.[2] C01B *25/10, 25/12*

U.S. Cl. 423—300 4 Claims

1. In the process of converting phosphorus trihalide to phosphorus oxyhalide by admixing and reacting such with oxygen under cooling conditions; the improvement, whereby effectively cooling the reaction mixture and substantially eliminating the hazard of explosion which occurs in a vapor containing oxygen over a liquid containing at least about 50% phosphorus trihalide, which comprises feeding a mixture of said phosphorus trihalide and between 50% and less than 100% of the stoichiometrically required amount of oxygen to the base of an agitated, elongated, substantially vertical reaction zone; reacting said phosphorus trihalide and said oxygen in an initial stage of said reaction zone under cooling conditions to an extent of at least about 50% of the fed phosphorus trihalide; thereafter withdrawing at least a portion of the reaction mixture from said reaction zone intermediate between said initial stage and the upper end of said reaction zone; pressurizing and agitating said withdrawn reaction mixture; admixing such with supplemental oxygen sufficient to cumulatively consist of at least about the stoichiometrically required oxygen; cooling said admixture; returning said admixture to said reaction zone; maintaining substantially no vapor space in those areas of said reaction zone where the concentration of phosphorus trihalide in liquid in those areas is at least about 50%; and recovering substantially pure phosphorus oxyhalide from the downstream end of said reaction zone.

3,956,464

PREPARATION OF PHOSPHATES

Erhart K. Drechsel, Houston, Tex.; John B. Sardisco, and James R. Stewart, Jr., both of Shreveport, La., assignors to Pennzoil Company, Shreveport, La.

Continuation-in-part of Ser. No. 81,280, Oct. 16, 1970. This application Apr. 19, 1971, Ser. No. 135,297

The portion of the term of this patent subsequent to Oct. 10, 1989, has been disclaimed.

Int. Cl.[2] C01B *13/16, 20/20*

U.S. Cl. 423—308 24 Claims

1. In a continuous process for the preparation of potassium dihydrogen phosphate by the steps involving the reaction of phosphate rock or solubilized form thereof with sulfuric acid, potassium hydrogen sulfate and recycle phosphoric acid at a temperature of about 40°–90°C. in a main reactor to form a resulting slurry containing KH_2PO_4, H_3PO_4 and precipitated calcium sulfate, removing the calcium sulfate solid from the mixture, precipitating KH_2PO_4 from the resultant solution by addition of an organic solvent, recovering the KH_2PO_4 from the phosphoric acid solution, removing the organic solvent from the phosphoric acid solution, and recycling at least a portion of the phosphoric acid solution to the main reactor, the improved steps which comprise:

a. conducting the initial step of the reaction by initially charging a mixture of phosphate rock or solubilized form thereof, sulfuric acid and recycle phosphoric acid to a reactor and adding to the material at a controlled rate at 10–50 weight percent aqueous solution of $KHSO_4$ until substantially complete reaction is obtained for the formation of filterable calcium sulfate crystals; and

b. removing the calcium sulfate crystals to provide a filtrate and evaporating the resultant filtrate to obtain a solids concentration of greater than about 40 wt. percent prior to precipitation of the KH_2PO_4.

3,956,465

SOLVENT PURIFICATION OF WET PROCESS PHOSPHORIC ACID

Robert Amanrich, Toulouse, France, assignor to Azote et Produits Chimiques S.A., Toulouse, France

Continuation of Ser. No. 151,504, June 9, 1971, abandoned. This application Feb. 7, 1974, Ser. No. 440,333

Claims priority, application France, June 12, 1970, 70.21581; Mar. 10, 1971, 71.08242

Int. Cl.[2] B01D *11/04;* C01B *25/22, 25/30*

U.S. Cl. 423—321 S 11 Claims

1. In a substantially continuous method of purifying an aqueous stream of wet process phosphoric acid, comprising the steps of solvent extracting phosphoric acid from said aqueous stream with a normally liquid organic solvent which is water miscible at 25°C. to the extent that a saturated solution of water and said solvent contains 2–30% by weight water and which solvent does not form a compound or complex with phosphoric acid which compound or complex cannot be disassociated during a subsequent reextraction step from the organic solvent, separating the organic solvent from said phosphoric acid, and recycling said solvent to the solvent extracting step,

wherein the improvement comprising substantially continuously regulating the water content of said recycled organic solvent prior to the step of said solvent extracting in order to employ as said organic solvent in said solvent extracting step, a mixture of said organic solvent with about 50–60% by weight of the amount of water required to saturate the solvent at about the average temperature of said extraction process, whereby the rate of extraction is increased as compared to higher amounts of water, and the rheological properties of the liquid in the extraction step are improved as compared to lower amounts of water.

3,956,466

PRODUCTION OF SILICO-FORMIC ACID

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Continuation-in-part of Ser. No. 262,485, June 14, 1972, which is a continuation-in-part of Ser. No. 71,628, Sept. 11, 1970, abandoned. This application Feb. 21, 1975, Ser. No. 551,534

Int. Cl.[2] C01B *15/14, 32/20*

U.S. Cl. 423—325 7 Claims

1. The method of producing silico-formic acid (H.SiO.OH) by chemically reacting an alkali metal metasilicate with an acid hydrogen containing salt in the ratio of 1:2 mols by the following steps; whereby

a. the alkali metal metasilicate is mixed with an acid hydrogen containing salt, and the reaction is completed in 1 to 2 hours; at about between 30° to 100°C, and oxygen is evolved from the reaction, leaving a white granular mixture, containing alkali metal salt and silico-formic acid;

b. the white granular substance is washed with water, filtered to remove the alkali metal salt, and then air dried at 25° to 75° C., leaving a fine white granular compound, silico-formic acid.

3,956,467

PROCESS FOR PRODUCING ALKALI METAL POLYSILICATES

Orlando L. Bertorelli, 105 Francis St., Rte. 2, Havre de Grace, Md. 21078

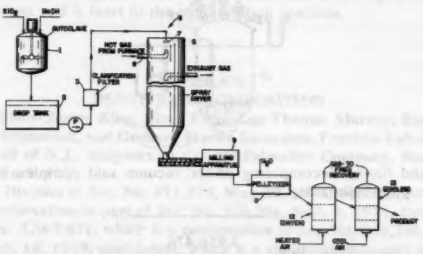
Filed June 7, 1974, Ser. No. 477,385

Int. Cl.[2] C01B *33/32*

U.S. Cl. 423—332 5 Claims

1. In a method for producing alkali metal silicates, comprising the steps of subjecting an aqueous dispersion including finely divided silica and an alkali metal hydroxide to hydrothermal treatment for a period of time effective to react said silica and said hydroxide to form a silicate that is at least partially polymerized; passing said reaction mixture into a

drying chamber and dispersing said mixture in the form of fine droplets in said chamber; contacting said droplets with a mass of air at a temperature sufficient to dry said droplets in the form of minute hollow spheres; fracturing and pulverizing said hollow spheres so that the density of the resulting fractured particles is increased to at least 30 pounds per cubic foot; pelletizing said fractured particles to form particles having continuously even surfaces; and drying and cooling said pel-



lets, the improved steps comprising drying said pellets by introducing said pellets into a drying zone countercurrently to a hot drying and fluidizing gas introduced into a lower section of said zone; passing said hot gas through said zone at a fluidizing velocity to maintain a fluidized mass of pellets so as to heat and dry same, said hot gas being the sole means of drying said pellets; gravitating dried pellets from an upper section of the fluidized mass of pellets in said zone and recovering and cooling the dried pellets.

3,956,468

PROCESS FOR THE PREPARATION OF CARBONYLDIISOCYANATE

Hermann Hagemann, Cologne, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 11, 1975, Ser. No. 548,933

Claims priority, application Germany, Feb. 20, 1974, 2408069

Int. Cl.² C01C *3/00*

U.S. Cl. 423—365 **6 Claims**

1. A process for the preparation of carbonyldiisocyanate comprising reacting trichloroisocyanuric acid and/or an alkali metal salt of dichloroisocyanuric acid with N-chlorocarbonylisocyanate at a temperature of from about 20°C to about 200°C.

3,956,469

PROCESS FOR PREPARING CATALYSTS CONTAINING PLATINUM METAL

Hussain El-Ghatta, Chur, Grisons, and Johann Karl Forrer, Domat-ems, Grisons, both of Switzerland, assignors to Inventa AG fur Forschung und Patentverwertung, Zurich, Switzerland

Filed Oct. 7, 1974, Ser. No. 512,640

Claims priority, application Switzerland, Oct. 10, 1973, 14457/73

Int. Cl.² C01B *21/14*; B01J *23/42*

U.S. Cl. 423—387 **6 Claims**

1. A process for preparing an improved platinum metal catalyst which comprises contacting a supported platinum metal catalyst with

a hydroxylammonium salt and a sulfur-containing compound, which liberates sulfurous acid under acidic conditions, in a mineral acid medium.

said process being conducted substantially in the absence of reducing agents capable of reducing sulfurous acid to sulfide, said sulfur compound being present in an amount corresponding to 15 to 150 atom % sulfur based on the amount of platinum metal, said process being conducted under an atmosphere of inert gas.

3,956,470

PENTAFLUOROSULFUR HYPOCHLORITE

Douglas Eugene Gould, Boonton; David Edward Young, Denville; Lowell Ray Anderson, Parsippany, and William Burke Fox, Morristown, all of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed June 6, 1968, Ser. No. 734,891

Int. Cl.² C01B *7/24*

U.S. Cl. 423—466 **17 Claims**

1. SF_5OCl.

2. The process for preparing the compound of claim 1 which comprises reacting SOF_4 with an inorganic chlorinating reagent containing a chlorine atom in a +1 oxidation state, which chlorine atom is attached to a more electronegative element, in the presence of an alkali metal fluoride selected from the group consisting of LiF, NaF, KF, RbF and CsF at about −78° to +25°C.

3,956,471

PROCESS OF MAKING CALCIUM HYPOCHLORITE

Brian James Pullman, Mitcham; William Denny Mant, Balwyn, both of Australia, and Gordon Leigh Ross, Otterburn Park, Canada, assignors to ICI Australia Limited, Melbourne, Australia and Canadian Industries, Ltd., Montreal, Canada

Filed July 1, 1974, Ser. No. 484,932

Claims priority, application Austria, July 13, 1973, 4090/73

Int. Cl.² C01B *11/06*

U.S. Cl. 423—474 **7 Claims**

1. A process for the continuous preparation of a calcium hypochlorite slurry which comprises:

a. continuously pumping into a first stirred reactor an aqueous slurry of calcium hydroxide and sodium hydroxide while simultaneously passing chlorine gas into the reaction mixture at such a rate that the redox potential is in the range from 650 – 850 mV;

b. allowing the contents of said first reactor to overflow continuously into a second stirred reactor;

c. simultaneously passing chlorine gas into said second stirred reactor at such a rate that the redox potential is in the range from 650 – 950 mV;

d. allowing the contents of said second stirred reactor to overflow; and

e. removing the overflow from said second stirred reactor, while independently maintaining the temperature of the contents of said first and second stirred reactor in the range from 15° to 35°C.

3,956,472

REMOVAL OF BORON FROM MAGNESIUM CHLORIDE BRINES

Gary R. Vance, East Windsor, N.J., assignor to N L Industries, Inc., New York, N.Y.

Filed Apr. 3, 1975, Ser. No. 564,740

Int. Cl.² C01F *5/30*

U.S. Cl. 423—497 **5 Claims**

1. Method for removing boron from naturally occurring $MgCl_2$ brines consisting essentially of from 6–8% Mg, from 400 to 500 ppm boron and lesser amounts of metal salts including potassium by liquid-liquid extraction comprising: introducing a fluoride ion into said brine by adding an aqueous solution of hydrogen fluoride thereto, reacting said fluoride ion with said brine for a predetermined period of time to form an insoluble potassium tetrafluoborate salt in said brine and adjusting the brine to a pH less than about 1 to effectively settle out the insoluble salt from the substantially boron-free brine.

3,956,473

PROCESS FOR OXIDIZING HYDROGEN SULFIDE TO SULFUR BY MEANS OF MOLECULAR OXYGEN IN THE PRESENCE OF TRANSITION METAL COMPLEXES AS CATALYSTS

Hubert Mimoun, Paris; Christian Bocard, Orgeval, and Irenee Seree De Roch, Rueil-Malmaison, all of France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants, Rueil-Malmaison, France

Filed Oct. 1, 1973, Ser. No. 402,052

Claims priority, application France, Oct. 2, 1972, 72.34901; Nov. 17, 1972, 72.41059

Int. Cl.² C01B *17/04*

U.S. Cl. 423—573 R 8 Claims

1. A process which comprises catalytically oxidizing hydrogen sulfide to sulfur by means of molecular oxygen, in homogeneous liquid phase, in an organic solvent having a water content not in excess of 60% by volume during the reaction, said solvent being of the basic type selected from the group consisting of amides, phosphoramides, sulfoxides, nitriles and ethers, and as a catalyst an iron dialkyldithiocarbamate, said sulfur produced thereby being pure, crystalline and easily recoverable.

3,956,474

PROCESS FOR PRODUCING AMMONIUM METATUNGSTATE FROM AMMONIUM TUNGSTATE BY DIGESTION IN SILICA

Joseph E. Ritsko, Towanda, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jan. 27, 1975, Ser. No. 544,058

Int. Cl.² C01G *41/00*

U.S. Cl. 423—593 3 Claims

1. A process for producing ammonium metatungstate from ammonium tungstate solution the process comprising:

a. adding at least about 1.5 weight percent of silica on a WO_3 basis to a solution consisting essentially of ammonium tungstate,

b. digesting the solution at a temperature of at least about 98°C for at least about 4 hours to lower the pH thereof to below at least about 4.5 and to form metatungstate ions, and

c. separating the aqueous AMT solution containing the metatungstate ions from the silica.

3,956,475

METHOD FOR THE PREPARATION OF COPPER HYDROXIDE AND OF A CATALYST OBTAINED FROM THIS HYDROXIDE

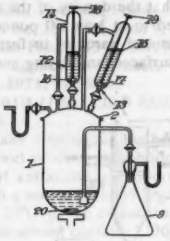
Stanislas Teichner, Villeurbanne, and Bernard Echevin, La-Chambre, both of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Dec. 21, 1973, Ser. No. 377,295

Int. Cl.² C01G *3/02*; B01J *23/72*

U.S. Cl. 423—604 7 Claims

1. A method for the preparation of copper hydroxide comprising reacting under anhydrous conditions an inorganic salt of copper with ammonia in the presence of a lower alkanol solvent for said inorganic salt of copper to form a complex of said ammonia and said inorganic salt of copper, introducing into the reaction medium at least one alkali metal hydroxide



and finally decomposing under vacuum said complex into copper hydroxide.

3,956,476

BARIUM SULFATE CONTRAST MEDIUM CONTAINING ASCORBIC ACID, ERYTHORBIC ACID OR A WATER-SOLUBLE SALT THEREOF

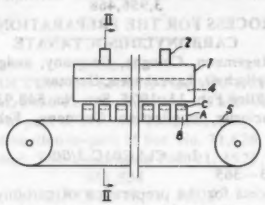
Koji Daigo; Shinichi Okuyama, both of Sakai, and Kyuzo Oda, Suita, all of Japan, assignors to Sakai Chemical Industry Company Ltd., Japan

Filed June 12, 1973, Ser. No. 369,312

Claims priority, application Japan, Sept. 14, 1972, 47-92562

Int. Cl.² A61K *29/02*

U.S. Cl. 424—4 3 Claims



1. An aqueous barium sulfate contrast medium which comprises barium sulfate, carbon dioxide, a suspending agent and an additive selected from the group consisting of ascorbic acid, erythorbic acid and a water-soluble alkali metal salt thereof, the barium sulfate concentration being at least 750 grams per liter of the medium, the carbon dioxide concentration being 0.2 to 4 gas volumes and the additive concentration being in the range of 1 mg% to 150 mg%.

3,956,477

METHOD AND ERYTHROCYTE PREPARATION FOR REVERSE BLOOD GROUPING

Richard T. Price, Verona; Rita C. Prodell, West Orange, and Stephen B. Friedman, Stanhope, all of N.J., assignors to Akzona Incorporated, Asheville, N.C.

Filed June 8, 1973, Ser. No. 368,158

Int. Cl.² G01N *31/00*, *33/16*

U.S. Cl. 424—8 11 Claims

1. A stable preparation of human erthrocyte stroma for use in reverse blood typing comprising (a) the stroma of human erythrocytes prepared by hemolyzing a given quantity of erythrocytes by hypotonic hemolysis using a sequence of progressively less concentrated aqueous hypotonic buffers to form stroma wherein the stroma cells are generally in the form of discoid bodies having the reticular membrane of the cell substantially intact, said reticulum carrying an amount of blood group antigens which is sufficient to enter into agglutination reaction when contacted with human blood serum or

plasma to be tested to indicate the presence therein of homologous blood group antibodies, the reticulum of said hemolyzed erythrocytes being stained to contrast in color with the blood fluids to be tested and thereby aid in visualization of the agglutination reaction; (b) an aqueous buffer solution which is approximately isotonic to the stromatal erythrocytes, maintains the dispersibility thereof, and serves as a carrier liquid for the stroma during storage and prior to use; and (c) an antibacterial agent which impedes bacterial attack upon the stroma and is inert to the agglutination reaction.

3,956,478

DENTIFRICE COMPOSITION

William James King, River Edge; Leo Thomas Murray, East Brunswick, and Gerhard Martin Salzmann, Franklin Lakes, all of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 471,378, May 20, 1974, which is a continuation-in-part of Ser. No. 176,396, Sept. 9, 1971, Pat. No. 3,864,471, which is a continuation of Ser. No. 848,241, Nov. 16, 1969, abandoned, which is a continuation-in-part of Ser. No. 785,731, Dec. 20, 1968, abandoned. This application May 6, 1975, Ser. No. 575,021

Int. Cl.² A61K *7/18*

U.S. Cl. 424—52 **6 Claims**

1. A dentifrice composition comprising a water-soluble monofluorophosphate in amount which provides about 0.01–1% by weight fluorine to the dentifrice and about 20–95% by weight of a water-insoluble compatible polishing material consisting essentially of a mixture of calcium carbonate with hydrated alumina; the ratio of said calcium carbonate to said hydrated alumina being about 3:1 to about 1000:1; said dentifrice having an initial pH of about 7 to 9.5.

3,956,479

PHARMACEUTICAL COMPOSITION CONTAINING NOVEL QUATERNARY AMMONIUM COMPOUNDS

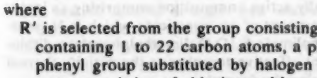
Robert Andrew Bauman, New Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 578,981, Sept. 13, 1966, abandoned, which is a division of Ser. No. 712,968, March 14, 1968, Pat. No. 3,621,048. This application Apr. 16, 1971, Ser. No. 134,827

Int. Cl.² A61K *7/22*

U.S. Cl. 424—54 **9 Claims**

1. An oral preparation comprising an oral vehicle containing about 0.1 to 5% by weight of a chemical compound having a composition represented by the formula:



where

R′ is selected from the group consisting of an alkyl group containing 1 to 22 carbon atoms, a phenyl group and a phenyl group substituted by halogen selected from the group consisting of chlorine and bromine;

R″ and R‴ are each selected from the group consisting of an alkyl group containing 1 to 2 carbon atoms;

R⁗ is an alkyl group containing 10 to 22 carbon atoms, a phenyl group substituted by halogen selected from the group consisting of chlorine and bromine, divalent alkyl group having up to 10 carbon atoms, divalent phenyl group and monovalent phenyl group;

Y is selected from the group consisting of oxygen and sulfur;

Z is selected from the group consisting of oxygen and sulfur, at least one of Y and Z being sulfur;

n is an integer 2 to 6; and

X is a compatible anion selected from the group consisting of chloride, bromide, iodide and methosulfate.

3,956,480

TREATMENT OF TEETH

Michael Dichter, Brooklyn; Durydehan Mangaraj, Staten Island, both of N.Y., and William James King, River Edge, N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed July 1, 1974, Ser. No. 484,722

Int. Cl.² A61K *7/22, 31/14, 31/74*

U.S. Cl. 424—54 **31 Claims**

1. Process for treating teeth in the mouth which comprises providing at the surface of the teeth a sorbed complex of a cationic germicide and a water-soluble synthetic anionic polymer by applying to said surfaces under non-drying conditions an aqueous dispersion of said complex, the total concentration, in said dispersion, of said cationic germicide and said anionic polymer complexed therewith being less than about 0.5%, said complex being substantive to hydroxyapatite when hydroxyapatite is contacted with said dispersion, the concentration of each of said anionic polymer and said cationic germicide in said dispersion being at least about 0.01%.

3,956,481

HYDROSOLUBLE EXTRACTS OF MYCOBACTERIA, THEIR PREPARATION AND USE

Pierre Jolles, Paris, and Daniele Migliore-Samour, Kremlin-Bicetre, both of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed June 19, 1973, Ser. No. 371,658

Claims priority, application France, June 20, 1972, 72.22208; May 4, 1973, 73.16130

Int. Cl.² A61K *39/02*

U.S. Cl. 424—92 **6 Claims**

1. A process for the preparation of a hydrosoluble extract of delipidated D-wax-containing mycobacteria, said extract having a molecular weight in the range of about 3,500 to 30,000, said process consisting essentially of extracting a bacterial residue of said delipidated mycobacteria with water, separating the aqueous solution from the undissolved residue, adding a salt to the aqueous solution in amount sufficient to precipitate a portion of the solute, separating the precipitate from the salt solution, separating the dissolved salt from the extract dissolved in said solution, subjecting the salt-free extract to chromatographic fractionation, and eluting and recovering a fraction which, upon freeze-drying, is a pulverulent white powder which contains (a) alanine, glutamic acid and α,α'-diaminopimelic acid in a molar ratio of about 3:2:2, (b) N-acetylglucosamine and N-glycolylmuramic acid in approximately equimolar amounts and a small amount of N-acetylgalactosamine, (c) arabinose, galctose and mannose, and (d) less than about 0.5% of lipids.

3,956,482

MILK PRODUCTION

Peter A. Hahn, Grosse Point Park, Mich., and Kamal M. Abdo, Columbia, Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 373,142, June 25, 1973. This application Apr. 7, 1975, Ser. No. 565,837

The portion of the term of this patent subsequent to Dec. 31, 1991, has been disclaimed.

Int. Cl.² A61K *39/02*; A23K *1/00*

U.S. Cl. 424—93 **4 Claims**

1. The method of improving rumen acetate/propionate ratios and milk production which is well known to be closely related to a high acetate/propionate ratio, and rises and falls in a qualitative relation with this ratio, in a lactating dairy cow that comprises administering to the rumen of the lactating cow at calving or 80–140 days after calving an effective amount of acetate-producing rumen microorganisms, effective to increase the acetate/propionate ratio in the rumen cultured on and adapted to a high concentrate nutrient medium, said acetate-producing microorganisms consisting essentially of:

Identification	Relative Percentage
Megasphaera elsdenii	0 – 4
Streptococcus bovis	30 – 42
Lactobacillus acidophilus	3 – 10
Bifidobacterium adolescentis	12 – 20
Bacteroides ruminicola	18 – 44
Butyrivibrio Fibrisolvens	3 – 12

the nutrient medium being an aqueous broth the solids of which consist essentially of:

45–95 parts concentrate
1–55 parts forage or roughage
0–10 parts molasses
0–10 parts minerals
0–40 parts artificial saliva mix.

3,956,483

PREPARING PANCREATIN

Sheldon H. Lewis, deceased, late of Chicago Heights, Ill. (by Barbara Lewis, administratrix), assignor to Wilson Pharmaceutical & Chemical Corporation, Chicago, Ill.

Continuation of Ser. No. 770,443, Oct. 24, 1968, abandoned. This application May 17, 1971, Ser. No. 144,230
Int. Cl.[2] A61K *37/48*
U.S. Cl. 424—94 **4 Claims**

1. The method of preparing in dry powder form a therapeutic pancreatin composition having proteolytic, amylolytic and lipolytic activity which comprises adding to comminuted pork or beef pancreas with thorough mixing an aqueous medium containing calcium sulfate in an amount between 0.02% and 1.4% based upon the weight of comminuted pancreas, said aqueous medium incorporating added water in an amount up to about 5.5%, based upon the weight of comminuted pancreas, admixing proteolytic enzyme for trypsinogen and chymotrypsinogen selected from the group consisting of pork duodenum and trypsin in the pancreas whereby proteolytic activity is established, maintaining said admixture at a temperature of about 32°F. to 80°F. until activation is complete, washing said admixture with acetone and heating said washed admixture to a temperature in the range between 120°F. and 180°F. whereby the admixture is dehydrated and susceptible pathogenic bacteria are inactivated.

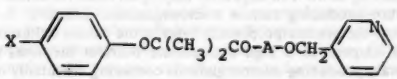
3,956,484

PYRIDYLMETHYL ESTERS OF N-(PHENOXYALKANOYL)PEPTIDE DERIVATIVES FOR THEREPEUTIC USE

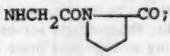
Jean-Marie Ferland, St. Laurent; Amedeo Failli, Montreal; Hans U. Immer, Mount Royal, and Manfred K. Gotz, Hudson, all of Canada, assignors to American Home Products Corporation, New York, N.Y.

Filed Sept. 11, 1974, Ser. No. 505,103
Int. Cl.[2] A61K *31/44, 37/00*
U.S. Cl. 424—177 **6 Claims**

1. A method for lowering levels of blood cholesterol and triglycerides in warm blooded animals which comprises administering to said animals a blood cholesterol and triglyceride lowering amount of a compound of the formula



in which X is selected from the group consisting of bromine, chlorine and lower alkyl and A is selected from the group consisting of $NHCH_2CO$, $NHCH_2CONHCH_2CO$ and



and acid addition salts thereof with pharmaceutically acceptable acids.

3,956,485

HATCHING AGENT FOR SUGAR BEET NEMATODE

James D. Willett, Moscow, and Luther Michael Cheek, Genesee, both of Idaho, assignors to Research Corporation, New York, N.Y.

Filed Feb. 15, 1974, Ser. No. 442,857
Int. Cl.[2] A01N *9/02, 9/08*
U.S. Cl. 424—195 **4 Claims**

1. A method of controlling the heterodera nematode population in soil suitable for the planting and growing of sugar beets which comprises extracting finely divided or macerated sugar beet with methanol or chloroform or a mixture thereof to dissolve or extract lipid material therefrom, fractionating the resulting extracted lipid material to separate a terpenoid-containing neutral lipid fraction, the terpenoid contained in said neutral lipid fraction having a molecular weight of about **255, 410** or **435** and applying the resulting terpenoid-containing neutral lipid fraction to soil prior to planting or seeding the soil with sugar beet in an amount effective to enhance the hatching of cysts and eggs of said nematodes.

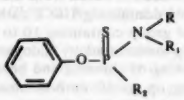
3,956,486

INSECTICIDAL PHTHALIMIDOTHIOPHOSPHATES ACTIVATED WITH CERTAIN PHOSPHOROTHIONATES

George B. Large, Orinda, and Leland S. Pitt, San Jose, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 30, 1974, Ser. No. 537,143
Int. Cl.[2] A01N *9/36*
U.S. Cl. 424—200 **26 Claims**

1. An insecticidally active composition comprising an insecticidally effective amount of an insecticide which is N-(mercaptomethyl) phthalimide-S-(O,O-dimethylphosphorodithioate) and an amount effective to enhance the activity thereof of an activator having the formula:



wherein R is selected from the group consisting of hydrogen and lower alkyl having from 1–6 carbon atoms; R_1 is selected from the group consisting of hydrogen, alkyl having from 1–10 carbon atoms and cyclohexyl and R_2 is selected from the group consisting of lower alkoxy having from 1–6 carbon atoms and

wherein R_3 and R_4 are the same or different and are selected from the group consisting of hydrogen and lower alkyl having from 1–6 carbon atoms; said activator being present in an amount ranging between 0.1 and 10 parts by weight per part by weight insecticide.

3,956,487

NOVEL ANTIFUNGAL ANTIBIOTIC SUBSTANCE, AND AGRICULTURAL AND HORTICULTURAL FUNGICIDAL COMPOSITION CONTAINING SAID SUBSTANCE

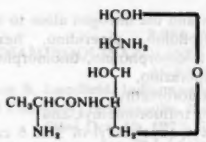
Toju Hata; Satoshi Omura; Michiko Katagiri, all of Tokyo; Juichi Awaya, Soka; Shimpei Kuyama, Tokyo; Shizuo Higashikawa, Kunitachi; Kazuomi Yasui, and Haruko Terada, both of Hino, all of Japan, assignors to Nihon Tokushu Noyaku Seizo Kabushiki Kaisha and The Kitasato Institute, both of Tokyo, Japan

Division of Ser. No. 272,217, July 17, 1972. This application Mar. 20, 1974, Ser. No. 453,041

Int. Cl.[2] A01N 9/00

U.S. Cl. 424—181 **2 Claims**

1. An agricultural and horticultural fungicidal composition which comprises a fungicidally effective amount of the antifungal antibiotic substance F-1028, as an active ingredient, having the following formula



or an hydrochloric acid salt or sulfuric acid salt thereof, which has the following properties (i) – (ix);

i. molecular weight of 219,

ii. colorless crystal,

iii. melting point of the hydrochloric acid salt thereof is above 195°C (decomposition)

iv. specific rotation of the hydrochloric acid salt thereof is $[\alpha]_D^{23} = 63.2°$ (c=1, H_2O),

v. UV spectrum of an aqueous solution of the hydrochloric acid salt thereof has no peculiar absorption as shown in FIG. 1,

vi. IR spectrum of a mixture of the hydrochloric acid salt thereof with potassium bromide is as shown in FIG. 2,

vii. Rf value in thin-layer chromatography with silica gel is 0.68 with a developing solvent consisting of n-propanol-pyridine-acetic acid-water in a ratio of 15:10:3:12; and 0.21 with a developing solvent consisting of butanol-acetic acid-water in a ratio of 3:1:2,

viii. readily soluble in water and insoluble in chloroform, benzene and ether, and

ix. color reaction is positive with ninhydrin, Ehrlich, Elson-Morgan, Tollens and Benedict reagents, and negative with Molisch, Sakaguchi, maltol and ferric chloride reagents, and an agricultural and horticultural assistant.

3,956,488

COMPOSITIONS AND METHODS FOR THE TREATMENT OF HELMINTHIASIS

John R. Egerton, Neshanic Station, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Sept. 27, 1973, Ser. No. 401,499

Int. Cl.[2] A61K 31/625

U.S. Cl. 424—232 **8 Claims**

1. A composition for the treatment of Haemonchus infections which comprises from 0.001 to 95% by weight of a combination of 5-isopropoxycarbonylamino-2-(4′-thiazolyl)-benzimidazole and about 100% by weight of 3′-chloro-4′-(p-chlorophenoxy)-3,5-diiodosalicylanilide and an inert carrier.

3,956,489

CERTAIN MIXED ANTIBACTERIALS

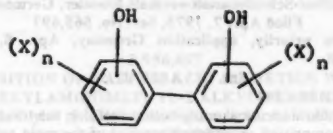
Nicholas M. Molnar, New York, N.Y.

Continuation-in-part of Ser. No. 242,763, April 10, 1972, abandoned. This application Jan. 23, 1974, Ser. No. 525,535

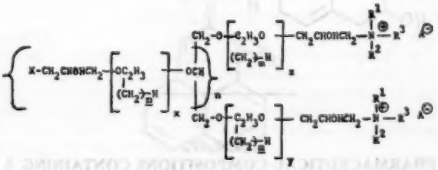
Int. Cl. A01n 9/02

U.S. Cl. 424—233 **8 Claims**

1. A topical antibacterial composition comprising an aqueous solution or emulsion of (a) an antibacterially effective amount of from about 0.05% to about 3% by weight of a halogenated salicylanilide, carbanilide or thiocarbanilide having one or two halogen atoms selected from the group consisting of chlorine and bromine on each phenyl ring and up to one trifluoromethyl on one phenyl ring; (b) an antibacterially effective amount of from about 0.025% to about 1% by weight of a halogenated 2-hydroxydiphenyl ether having one or two halogen atoms selected from the group consisting of chlorine and bromine on each phenyl ring or a halogenated bisphenol of the formula



where X is chlorine or bromine and n is 1 to 4; and (c) an antibacterially effective amount of from about 0.2% to about 4% by weight of a quaternary salt of the formula:



wherein

X is chlorine or bromine; each of R^1 and R^2 is alkyl of 1 to 3 carbon atoms;

R^3 is alkyl, alkenyl or haloalkyl of 6 to 18 carbon atoms;

A is a physiological acceptable monovalent anion;

each of x, y and z, independent of the other, has a value of from 1 to 10;

the sum of x, y and z is 9 to 15;

m has a value of 0 or 1; and

n has a value of from 1 to 4.

3,956,490

ADMINISTRATION OF ALKALINE EARTH METAL SALTS OF SALICYLAMIDE

Takeru Higuchi, Lawrence, Kans., and Anwar A. Hussain, Lexington, Ky., assignors to Interx Research Corporation, Lawrence, Kans.

Continuation-in-part of Ser. No. 255,901, May 22, 1972, abandoned, which is a continuation of Ser. No. 22,049, March 23, 1970, abandoned. This application Mar. 11, 1975, Ser. No. 557,367

Int. Cl.² A61K *31/615*, *31/60*

U.S. Cl. 424—233 11 Claims

1. The method of obtaining analgesia, lowering body temperature, treating inflammation, or obtaining sedation in a mammalian organism, which method comprises administering to such organism a unit dosage analgesically, antipyretically, anti-inflammatorily, or sedatively effective amount of an alkaline earth metal salt of salicylamide in a pharmaceutically acceptable carrier.

3,956,491

MEDICINE CONTAINING THE MAIN SAPOGENIN OF HELLEBORUS

Otto Isaac, Bruchköbel, Germany, assignor to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

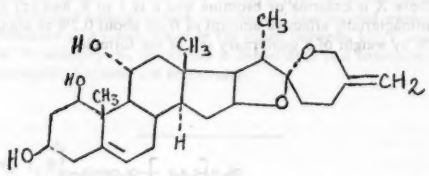
Filed Apr. 7, 1975, Ser. No. 565,697

Claims priority, application Germany, Apr. 8, 1974, 2416978

Int. Cl.² A61K *31/58*

U.S. Cl. 424—241 9 Claims

1. A pharmaceutical composition useful in the treatment of ulcers comprising an effective amount of the main sapogenin of the roots and rhizomes of Helleborus species and a nontoxic pharmaceutically acceptable carrier, said sapogenin having the formula



3,956,492

PHARMACEUTICAL COMPOSITIONS CONTAINING A 3-(AMINO-METHYLENE)-5-PHENYL-1,4-BENZODIAZEPIN-2-ONE AND METHOD OF USE

Helmut Pieper; Gerd Krüger; Johannes Keck, all of Biberach an der Riss; Klaus-Reinhold Noll, Warthausen-Oberhofen, and Joachim Kühling, Biberach an der Riss, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

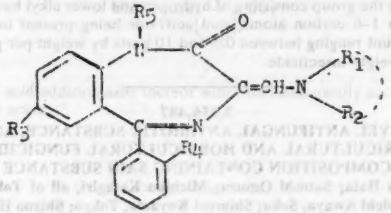
Division of Ser. No. 376,378, July 5, 1973, Pat. No. 3,872,090. This application Dec. 12, 1974, Ser. No. 532,069

Claims priority, application Germany, July 12, 1972, 2234150; May 15, 1973, 2324962

Int. Cl.² A61K *31/33*, *31/54*, *31/495*, *31/535*

U.S. Cl. 424—244 20 Claims

1. A pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective sedative, tranquilizing, muscle-relaxing or anticonvulsive amount of a compound of the formula



wherein R_1 and R_2 are each hydrogen, cycloalkyl of 3 to 6 carbon atoms, phenyl,

—A—Y

where

A is alkyl of 1 to 5 carbon atoms or alkenyl of 1 to 5 carbon atoms, and

Y is furyl, di(lower alkyl)amino, hydroxyl, lower alkoxycarbonyl or carbamido,

or, together with each other and the nitrogen atom to which they are attached, pyrrolidino, piperidino, hexamethyleneimino, morpholino, thiomorpholino, thiomorpholino-S-oxide or N'-lower alkyl-piperazino,

R_3 is halogen, nitro or trifluoromethyl,

R_4 is hydrogen, halogen or trifluoromethyl, and

R_5 is hydrogen, lower alkyl, (cycloalkyl of 3 to 6 carbon atoms)-methyl, lower alkyl-amino-lower alkyl, di(lower alkyl)amino-lower alkyl or trifluoromethyl-lower alkyl.

3,956,493

LONG ACTING TRANQUILIZING AGENT

Harry L. Yale, New Brunswick, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Oct. 21, 1974, Ser. No. 516,701

Int. Cl.² C07D *279/30*

U.S. Cl. 424—247 4 Claims

2. A composition comprising 1-adamantanecarboxylic acid ester of pipotiazine in a physiologically acceptable vehicle therefor.

3,956,494

PHARMACEUTICAL COMPOSITIONS AND METHODS OF INHIBITING GASTRIC ACID SECRETION

Bernard Loev, Broomall, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

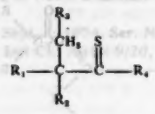
Division of Ser. No. 514,353, Oct. 15, 1974, Pat. No. 3,898,335, which is a continuation-in-part of Ser. No. 322,572, Jan. 10, 1973, Pat. No. 3,860,592. This application May 8, 1975, Ser. No. 575,885

Int. Cl.² A61K *31/535*

U.S. Cl. 424—248 12 Claims

1. A pharmaceutical composition having gastric acid secretion inhibitory activity, in dosage unit form, comprising a

pharmaceutical carrier and a gastric acid secretion inhibiting amount of a thioamide compound of the formula:



in which:

R_1 is 2-pyridyl or 2-quinolyl;

R_2 is di-lower alkylamino, piperidino, pyrrolidino, N-lower alkylpiperazino or morpholino;

R_3 is di-lower alkylamino, piperidino, pyrrolidino, N-lower alkylpiperazino or morpholino;

R_4 is NH-(lower alkyl), N(lower alkyl)$_2$, NH-phenyl, NH-$(CH_2)_n$-cycloalkyl, said cycloalkyl having 3–6 carbon atoms, or NH-R_5;

n is 0 or 1 and

R_5 is allyl or propargyl optionally substituted by methyl or ethyl groups, said R_5 having 3–6 carbon atoms or a pharmaceutically acceptable acid addition salt thereof.

3,956,495

2,4-DIAMINOQUINAZOLINES AS ANTITHROMBOTIC AGENTS

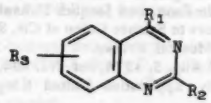
William B. Lacefield, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Oct. 30, 1973, Ser. No. 411,115

Int. Cl.² A61K *31/505*

U.S. Cl. 424—251 **21 Claims**

1. A method of inhibiting platelet aggregation in a warm-blooded animal in need of such inhibition which comprises parenterally administering to said animal an effective and nontoxic amount of a compound of the formula,

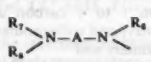


wherein R_1 and R_2 are monovalent groups independently selected from the group consisting of

a.

wherein R_4 and R_5 independently are selected from the group consisting of hydrogen, C_1-C_6 alkyl, and cycloalkyl having fewer than about 12 carbon atoms, with the proviso that both R_4 and R_5 cannot be cycloalkyl;

b.



wherein R_6, R_7, and R_8 independently are selected from the group consisting of hydrogen and C_1-C_6 alkyl, and A is a divalent organic group having from about two to about six carbon atoms such that the two nitrogen atoms are separated by at least two carbon atoms; and

c. monocyclic heterocyclic-amino consisting of substituted or unsubstituted five- or six-membered single heterocyclic rings having no more than about 12 atoms and containing one or two nitrogenn hetero atoms as the only hetero atoms; and

R_3 is selected from the group consisting of hydrogen, halogen, and C_1-C_3 alkyl; and physiologically-acceptable salts thereof.

3,956,496

INHIBITION OF GASTRIC ACID SECRETION WITH 2-(TETRAHYDROFURYL)PERIMIDINE

Russell J. Taylor, Jr., Palmyra, N.J., assignor to McNeil Laboratories, Incorporated, Fort Washington, Pa.

Continuation-in-part of Ser. No. 417,705, Nov. 20, 1973, abandoned. This application Dec. 12, 1974, Ser. No. 532,121

Int. Cl.² A61K *31/505*

U.S. Cl. 424—251 **2 Claims**

1. A method of inhibiting gastric acid secretion in a gastric hyperacidic subject which comprises internally administering thereto an effective gastric acid secretion inhibiting amount of a member selected from the group consisting of 2-(tetrahydrofuryl)-perimidine and a pharmaceutically acceptable acid addition salt thereof.

3,956,497

INHIBITION OF GASTRIC ACID SECRETION WITH 1-DIALKYLAMIDOMETHYL-2-ALKYL PERIMIDINES

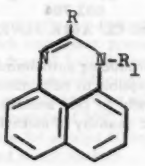
Russell J. Taylor, Jr., Palmyra, N.J., assignor to McNeil Laboratories, Incorporated, Fort Washington, Pa.

Continuation-in-part of Ser. No. 417,667, Nov. 20, 1973, abandoned. This application Feb. 7, 1975, Ser. No. 547,827

Int. Cl.² A61K *31/505*

U.S. Cl. 424—251 **2 Claims**

1. A method of inhibiting gastric acid secretion in a gastric hyperacidic subject which comprises internally administering thereto an effective gastric acid secretion inhibiting amount of a member selected from the group consisting of a substituted perimidine of the formula:



wherein R is a loweralkyl and R_1 is diloweralkylamidomethyl, and a pharmaceutically acceptable acid addition salt thereof.

3,956,498

INSECTICIDAL COMPOSITIONS CONTAINING 1,2,4-OXADIAZOLE AND THIADIAZOLE ESTERS

John D. Hagarty, Sturtevant, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

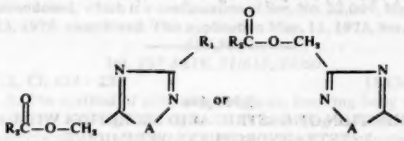
Division of Ser. No. 331,164, Feb. 9, 1973, Pat. No. 3,879,407. This application Feb. 3, 1975, Ser. No. 546,638

Int. Cl.² A01N *9/22, 9/28*

U.S. Cl. 424—270 **9 Claims**

1. An insecticidal composition consisting essentially of a major proportion of a non-toxic inert carrier and a minor, but

effective proportion as an essential active component thereof of a compound of the formula



wherein A is oxygen or sulfur, R_1 is selected from the group consisting of benzyl, substituted benzyl wherein the substituent is nitro, halo or lower alkyl having 1–6 carbon atoms, lower alkyl having 1–6 carbon atoms, lower alkenyl having 1–6 carbon atoms, furylmethyl, cyclopentylmethyl, cyclopentenylmethyl, cyclohexenylmethyl, and cyclohexylmethyl, and R_2 is the residue of a carboxylic acid selected from the group consisting of (+)-trans-chrysanthemumic acid, (±)-cis, trans-chrysanthemumic acid, dimethylcyclopropanecarboxylic acid, tetramethylcyclopropanecarboxylic acid, dihalocyclopropanecarboxylic acid, and tetrahalocyclopropanecarboxylic acid.

3,956,499

METHODS AND COMPOSITIONS FOR PRODUCING POLYPHASIC PARASITICIDE ACTIVITY USING METHYL 5-PROPYLTHIO-2-BENZIMIDAZOLECARBAMATE

Robert J. Gyurik, Coatesville, and Vassilios J. Theodorides, West Chester, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 480,646, June 19, 1974, Pat. No. 3,915,986. This application Aug. 7, 1975, Ser. No. 602,704

Int. Cl.² A61K *31/415*

U.S. Cl. 424—273 **14 Claims**

1. The method of producing anthelmintic activity in animals infected with or susceptible to helminthic infections comprising administering orally to said animals an anthelmintically effective but nontoxic quantity of methyl 5-propylthio-2-benzimidazolecarbamate.

3,956,500

CARBAMATE PESTICIDAL COMPOSITIONS

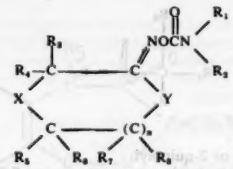
John A. Durden, Jr., South Charleston, and Arthur P. Kurtz, Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Apr. 3, 1973, Ser. No. 347,446

Int. Cl.² A01N *9/00, 9/12*

U.S. Cl. 424—276 **28 Claims**

1. A pesticide composition comprising an acceptable carrier and an effective, insecticidal, miticidal or nematocidal amount of a compound of the formula:



wherein:

R_1 and R_2 may be the same or different and may be hydrogen, lower alkyl, halogen substituted lower alkyl, cycloalkyl, lower alkoxyalkyl, lower alkylthioalkyl, lower alkylsulfinylalkyl, lower alkylsulfonylalkyl, lower alkenyl, lower alkynyl, aryl, aryl substituted with one or more halogen, lower alkyl or lower alkoxy substituents, lower alkanoyl, alkoxy or halogen substituted lower alkanesulfenyl with the proviso that when R_1 is lower alkoxy, lower alkanoyl or halogen substituted with alkanesulfenyl, R_2 is hydrogen, lower alkyl or halogen substituted lower alkyl;

R_3, R_4, R_5, R_6, R_7 and R_8 may be the same or different and may be hydrogen, alkyl, alkenyl, alkoxyalkyl, alkylthioalkyl, alkylsulfinylalkyl or alkylsulfonylalkyl, with the proviso that no one of said substituent groups may contain more than six carbon atoms;

X and Y may be O, S, SO or SO_2 with the proviso that X or Y is O and when X is O, Y is other than O and when Y is O, X is other than O; and

n is 0 or 1.

3,956,501

N-SUBSTITUTED GLYCINATES

Laszlo Beregi, Boulogne; Charles Malen, Fresnes; Pierre Hugon, Rueil Malmaison, and Jacques Duhault, Chatou, all of France, assignors to Science Union et Cie, Societe Francaise de Recherche Medical, France

Filed Aug. 5, 1974, Ser. No. 494,748

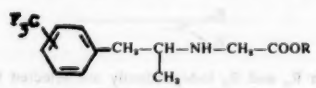
Claims priority, application United Kingdom, Aug. 16, 1973, 38730/73

Int. Cl.² C07C *101/16;* C07D *317/64*

U.S. Cl. 424—282 **9 Claims**

1. A compound selected from the group consisting of:

A. N-substituted glycinates of the general formula:



wherein:

R is selected from the group consisting of cyclopentyl, cyclohexyl, benzyl, chlorobenzyl, fluorobenzyl, alkylbenzyl and alkoxybenzyl wherein the alkyl and alkoxy moieties have from 1 to 4 carbon atoms inclusive, methylenedioxybenzyl and trifluoromethylbenzyl,

B. their optical isomers and

C. physiologically tolerable acid addition salts thereof.

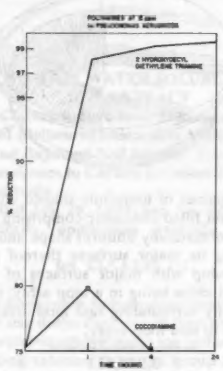
9. A method of treating a living animal body afflicted with obesity or metabolic disease requiring weight reduction or regulation comprising the step of administering an amount of a compound of claim 1 which is effective for the alleviation of the said condition.

3,956,502

POLYAMINE ALCOHOLS AS MICROBIOCIDES

Manuel Slovinsky, Woodridge, and Joseph Matt, Chicago, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Sept. 4, 1974, Ser. No. 503,145
Int. Cl.² A01N 9/20, 9/24
U.S. Cl. 424—304 12 Claims



1. A bactericidal or fungicidal composition effective against bacteria or fungi and suitable for utilization in cooling tower operation consisting of an antibacterial or antifungal effective amount of a compound selected from the group consisting of:

N^1-(2-hydroxy C_{11-14} alkyl) diethylene triamine;

N^1N^5 Bis (2-hydroxy decyl) tetraethylene pentamine;

N^1 cyanoethyl N^1,N^5 Bis (2-hydroxy C_{11-14} alkyl) diethylene triamine;

N^1N^5 Bis (2-hydroxy decyl) tetraethylene pentamine;

N^1 chloroethyl N^4 (2-hydroxy C_{11-14} alkyl) triethylene tetramine

in an aqueous carrier.

3,956,503

COMPOSITION FOR THE TREATMENT AND THE PREVENTION OF HELIENCEPHALITIS, THERMOPLEGIA AND OTHER DISORDERS IN DOMESTIC ANIMALS AND POULTRY

Eiichi Shimizu, Irima, Japan, assignor to Daiichi Seiyaku Co., Ltd., Tokyo, Japan

Filed Oct. 11, 1973, Ser. No. 405,494
Claims priority, application Japan, Oct. 12, 1972, 47-102246
Int. Cl.² A61L 31/215
U.S. Cl. 424—305 4 Claims

1. A method for the treatment of heliencephalitis, thermoplegia, and increased body temperature arising from the fighting of domestic animals, which comprises:

administering trans-4-aminomethylcyclohexanecarboxylic acid, a lower alkyl ester, an aryl ester or a pharmaceutically acceptable inorganic or organic salt thereof to said animals in an amount ranging from 1 to 100 mg/kg/day.

3,956,504

METHOD OF PREVENTING THROMBOSES

Philip Nicholas Sawyer, 606 Third St., Brooklyn, N.Y. 11215

Continuation-in-part of Ser. No. 259,271, June 2, 1972, abandoned, which is a continuation-in-part of Ser. No. 46,531, June 15, 1970. This application Nov. 5, 1973, Ser. No. 412,570
Int. Cl.² A61K 31/195
U.S. Cl. 424—319 4 Claims

1. A process for treating thromboses comprising administering to a human being in need of said treatment an anti-thromboses effective amounts of potassium salt of para amino benzoic acid.

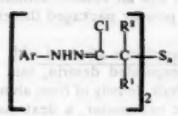
3,956,505

INSECTICIDAL BIS-PHENYLHYDRAZONE SULFIDES

Joseph E. Moore, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 470,482, May 16, 1974, Pat. No. 3,867,450. This application Jan. 27, 1975, Ser. No. 544,149
Int. Cl.² A01N 9/20, 9/24
U.S. Cl. 424—327 14 Claims

1. A method of controlling insects selected from the group consisting of cabbage looper larvae and alfalfa weevil larvae which comprises contacting said pre-adjult insects with a metamorphosis disrupting effective amount of a compound of the formula



wherein R^1 and R^2 individually are hydrogen or alkyl of 1 to 6 carbon atoms, Ar is phenyl substituted with up to 5 fluoro, chloro or bromo groups or with up to 2 nitro groups and *n* is 1, 2, or 3.

3,956,506

JUNIOR CEREAL AND PROCESS

Larry L. Cloud; Vincent J. Kelly, and Wayne J. Smalligan, all of Fremont, Mich., assignors to Gerber Products Company, Fremont, Mich.

Filed Mar. 26, 1975, Ser. No. 562,380
Int. Cl.² A23L 1/10
U.S. Cl. 426—28 12 Claims

1. A method for preparing an instant grain cereal having a coarse texture, which comprises: providing as a slurry, grain cereal flour having from 2.5–10.0 times by weight of water based on solids content, and reducing sugars in an amount of from 12–30 weight percent based on solids content; sterilizing said slurry at a temperature of 200° F – 308 ° F and a pressure in excess of 30 p.s.i.g. for at least 10 seconds; and drying and flaking said sterilized slurry mixture.

3,956,507

SWEETENING COMPOSITION AND PROCESS THEREFOR

Myron D. Shoaf, and LaMonte D. Pischke, both of Danbury, Conn., assignors to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 421,295, Dec. 3, 1973. This application Nov. 26, 1974, Ser. No. 527,329
Int. Cl.² A23L 1/236
U.S. Cl. 426—96 15 Claims

1. Process for stabilizing the methyl ester of L-aspartyl L-phenylalanine (APM) into a flowable particulate form which

comprises: (a) admixing crystals of APM; (b) a matrix-forming material that is capable of being molten at a temperature at or below 370°F, solidifies into a solid mass when cooled to below its melting point and retains a thermosetting solid condition at ambient packaging conditions to form a matrix; and (c) an effective amount of a surface active dispensing agent that renders said matrix-forming material more readily soluble; heating the admixture to convert the matrix-forming material into a continuous molten condition at a moisture content less than 10% and wherein the APM is discretely distributed; cooling the heated admixture to below the melting point of the matrix-forming material to solidify it; and subdividing the mass to a particulate size wherein the particles encapsulate the APM distributed therein.

3,956,508

ALCOHOL-CONTAINING DEXTRIN POWDER

William A. Mitchell, Lincoln Park, N.J., and William C. Seidel, Monsey, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Division of Ser. No. 240,272, March 31, 1972, Pat. No. 3,795,747. This application Feb. 28, 1974, Ser. No. 446,877

The portion of the term of this patent subsequent to Mar. 5, 1991, has been disclaimed.

Int. Cl.² C12G *3/00, 3/08;* B65D *85/00*

U.S. Cl. 426—106 **2 Claims**

1. A food package comprising, in combination, a hermetically sealed container and an ethanol-containing dry-to-the-touch, flowable food powder packaged therein, said powder comprising:

a. food flavoring ingredients admixed with

b. particulates of expanded dextrin, said particulates of dextrin having a bulk density of from about 0.05 to about 0.30 grams/cubic centimeter, a dextrose equivalent of from about 5 to 15, a particle size corresponding to a 20–60 mesh screen opening (U.S.S.Sieve), a moisture content ranging from about 2% to about 6% and said dextrin having sorbed therein an aqueous alcohol solution to provide from about 30% to about 60% of added ethanol by weight of the resulting dextrin/ethanol mixture.

3,956,509

ALCOHOL-CONTAINING DEXTRIN POWDER

William A. Mitchell, Lincoln Park, N.J., and William C. Seidel, Monsey, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Division of Ser. No. 345,143, March 26, 1973, Pat. No. 3,821,433, which is a continuation-in-part of Ser. No. 240,272, March 31, 1972, Pat. No. 3,795,747. This application Feb. 28, 1974, Ser. No. 446,879

The portion of the term of this patent subsequent to Mar. 5, 1991, has been disclaimed.

Int. Cl.² C12G *3/00, 3/08;* B65D *85/00*

U.S. Cl. 426—106 **3 Claims**

1. A comestible-containing package comprising in combination a hermetically sealed container and a flowable, dry-to-the-touch alcohol-containing powder packaged therein, said alcohol containing powder comprising:

a. particulates of non-anhydrous expanded dextrin, said particulates of dextrin having a bulk density ranging from about 0.05 to about 0.30 grams/cubic centimeter, a dextrose equivalent of from about 5 to about 15 and further characterized by having more than 50% of the trimer, hexamer and heptamer oligomers by weight of its total oligomer (10 or less degree of polymerization) content and less than about 1% glucose, a moisture content of from about 2% to about 6% by weight, and having a particle size corresponding to a 20–60 mesh screen opening (U.S.S. Sieve), and

b. sorbed within said dextrin particulates in an amount ranging from about 30% to about 60% by weight of said powder, an aqueous solution of ethanol containing from about 5% moisture by weight to about 25%.

3,956,510

PACKAGE FOR UNIFORMLY SHAPED CHIP SNACK FOOD PRODUCTS

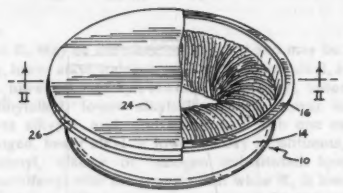
Nelson J. Beall, Albertville, Minn.

Continuation-in-part of Ser. No. 352,811, April 19, 1973, Pat. No. 3,852,485, which is a continuation-in-part of Ser. No. 159,891, July 6, 1971, abandoned. This application Nov. 20, 1974, Ser. No. 435,896

The portion of the term of this patent subsequent to Dec. 3, 1991, has been disclaimed.

Int. Cl.² B65B *23/00*

U.S. Cl. 426—106 **3 Claims**



1. A filled container of uniformly shaped chip type snack food products, said filled container comprising a plurality of nested chips of substantially uniform shape and size, each of said chips having its major surfaces thereof positioned in abutting relationship with major surfaces of the adjacent chips, said nested chips being in a loop array; and container means substantially surrounding said loop array to maintain said nested chips in said loop array.

3,956,511

ALCOHOL-CONTAINING DEXTRIN POWDER

William A. Mitchell, Lincoln Park, N.J., and William C. Seidel, Monsey, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Division of Ser. No. 240,272, March 31, 1972, Pat. No. 3,795,747. This application Feb. 28, 1974, Ser. No. 446,878

The portion of the term of this patent subsequent to Mar. 5, 1991, has been disclaimed.

Int. Cl.² C12G *3/00, 3/08;* B65D *85/00*

U.S. Cl. 426—106 **2 Claims**

1. A comestible-containing package comprising in combination a hermetically sealed container and a flowable, dry-to-the-touch, alcohol-containing powder packaged therein, said powder comprising;

a. particulates of dry expanded dextrin, said particulates of dextrin having a dextrose equivalent of from about 5 to about 15, a particle size corresponding to a 20–60 mesh screen opening (U.S.S. Sieve), a moisture content ranging from about 2% to about 6%, a bulk density ranging from about 0.05 to about 0.30 grams/cubic centimeter; and

b. said dextrin having sorbed therein an aqueous alcoholic solution to provide from about 30% to about 60% by weight of ethanol sorbed within the resultant ethanol containing powder.

3,956,512

COLLAGEN COMPOSITIONS AND THE METHOD OF PREPARING THE SAME

Thomas E. Higgins, Brookfield, Ill., assignor to Union Carbide Corporation, New York, N.Y.

Filed Apr. 28, 1975, Ser. No. 572,322

Int. Cl.² A22C *13/00*

U.S. Cl. 426—140 **19 Claims**

1. A method of preparing a formable collagen composition suitable for use in preparing a shaped collagen structure which exhibits improved antiblocking characteristics including the step of uniformly incorporating into a formable collagen composition an antiblock additive selected from the group consisting of fatty acid partial esters of a polyhydric alcohol having at least one free hydroxyl group, acetylated fatty acid partial

esters of a polyhydric alcohol having at least one free hydroxyl group, and mixtures of the same, in an amount of at least about 1% by weight of said additive based on the solids content of said collagen composition.

3,956,513

PREPARATION OF A WATER SOLUBLE ISOMERISED HOP EXTRACT

Brian James Clarke; Robert Peter Hildebrand; David George Lance, all of Melbourne; Alexander William White, Mount Waverly, and Raymond Neil Skinner, Greensborough, all of Australia, assignors to Carlton & United Breweries Limited, Carlton, Australia

Filed Jan. 28, 1975, Ser. No. 544,705

Claims priority, application Australia, Feb. 4, 1974, 6443/74

Int. Cl.² A23L *1/22*

U.S. Cl. 426—271 **12 Claims**

1. A water-dispersible isohumulone-containing product in solid form for use in the flavoring of food or beverages which comprises a water-insoluble metal ion isohumulone complex, said metal being selected from the group consisting of calcium, magnesium, zinc, manganese and nickel and the complex having a particle size of less than 200 microns, and an alkali metal compound selected from the group consisting of an alkali metal tripolyphosphate and a mixture of a dialkali metal salt of ethylenediaminetetracetic acid with a tetraalkali metal salt of ethylenediaminetetracetic acid, said alkaki metal being selected from the group consisting of sodium and potassium, the alkali metal compound reacting with the water-insoluble metal ion isohumulone complex in the presence of water to produce a water-soluble alkali metal isohumulone complex, the molar ratio of the alkali metal compound in the product to the isohumulone present in the water-insoluble metal ion isohumulone complex being at least 0.8 to 1, whereby when the product is added to an aqueous medium there is formed an aqueous solution of an alkali metal salt of isohumulone having a ratio of insoluble precipitates to isohumulone in the solution of not greater than 0.1 to 1 by weight.

12. A method for producing an aqueous solution of insohumulone for use in the flavoring of food or beverages which comprises adding to an aqueous medium, with agitation, a water-insoluble metal ion isohumulone complex, said metal being selected from the group consisting of calcium, magnesium, zinc, manganese and nickel and the complex having a particle size of less than 200 microns, and an alkali metal compound selected from the group consisting of an alkali metal tripolyphosphate and a mixture of a dialkali metal salt of ethylenediaminetetracetic acid with a tetraalkali metal salt of ethhylenediaminetetracetic acid, the alkali metal being selected from the group consisting of sodium and potassium, the molar ratio of the alkali metal compound to the isohumulone in the water-insoluble metal ion isohumulone complex being at least 0.8 to 1 and the concentration of isohumulone in the aqueous medium being not more than 2% by weight, whereby said alkali metal compound reacts with the water-insoluble metal ion isohumulone complex in the aqueous medium to produce a water-soluble alkali metal isohumulone complex, the conversion to the water-soluble salt being at least 80%, and the ratio of precipitates resulting from the reaction to the isohumulone in the solution being not more than 0.1 to 1 by weight.

3,956,514

PROCESS FOR PREPARING WET SPUN PROTEINACEOUS FILAMENTS

Moshe M. Sternberg, South Bend, and Chong Yol Kim, Elkhart, both of Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Sept. 25, 1974, Ser. No. 509,287

Int. Cl.² A23L *1/36;* **A23P** *1/00*

U.S. Cl. 426—276 **12 Claims**

1. A process for preparing wet spun proteinaceous filaments which comprises:

a. forming an aqueous first slurry of a pulverized, functional, low purity, defatted leguminous material having a protein content on a dry weight basis of about 45 to 55 percent;

b. adjusting the pH of said slurry to about the isoelectric pH of the leguminous protein to precipitate the protein on and into the insoluble portion of the leguminous material;

c. separating the solids from the liquid portion of said slurry;

d. forming an aqueous second slurry of said separated solids;

e. adjusting the pH of said second slurry to an alkaline pH from about 12.0 to 13.2 to produce a spinning dope having spinnable viscosity; and

f. forcing said spinning dope through a spinneret and into a coagulating bath to form proteinaceous filaments.

3,956,515

EDIBLE STARCH BATTERS

Carl O. Moore, Rochester; Hsiung Cheng, and Robert V. Schanefelt, both of Decatur, all of Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Apr. 5, 1974, Ser. No. 458,377

Int. Cl.² B65B *55/00*

U.S. Cl. 426—302 **22 Claims**

12. A method for coating food articles with a starch-based adhesive coating composition which is suitably adapted for preparing fried food articles, said method comprising the steps of:

A. preparing an edible aqueous batter by uniformly dispersing in water:

a. about 1 to about 40 parts by weight of a birefringent, granular, cold-water swelling starch, said granular cold-water swelling starch being characterized as exhibiting within ten minutes a loss of birefringency when 1% by weight of the cold-water swelling starch is dispersed in water at a temperature of less than 120°F.;

b. 200 parts by weight of an ungelatinized, granular starch characterized as requiring a temperature in escess of 125°F. (at 1% solids level in water) to convert the starch granules to a non-birefringent starch form; and

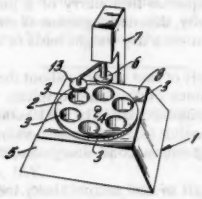
c. water at a starch solids to water weight ratio of less than about 2:3, with the cold-water swelling starch (a) and the ungelatinized granular starch (b) being uniformly dispersed in the water at a temperature below the gelation point of the ungelatinized granular starch (b) to provide an aqueous batter comprised of ungelatinized granular starch (b) uniformly dispersed within a matrix of the hydrated, non-birefringent cold water swelling starch (a); and

B. applying the aqueous batter to the surface of a food article and thereby providing a food article having a coating of said aqueous batter.

3,956,516
PROCESS FOR MOLDING FOODSTUFFS

Michael George Holt, Rose Cottage, Nadderwater near Exeter, Devon, and Denis Gordon Scott-Maxwell, Villa Franca, Tiverton, Devon, both of England

Filed Dec. 18, 1973, Ser. No. 425,816
Claims priority, application United Kingdom, Dec. 19, 1972, 58525/72
Int. Cl.² A22C 7/00; B65B 25/08
U.S. Cl. 426—420 8 Claims



1. A process for forming one or more pre-measured portions of sticky foodstuff materials into cohesive shaped masses in a continuous manner which comprises the steps of

sequentially advancing from a loading position to a forming position, relative to a supporting surface, forming means for said pre-measured portions having internal sidewalls having a configuration defining the desired shape for said portions, and being open at the top and bottom for passage of said portions into and out of said forming means,

inserting a lower separating means into said forming means against said supporting surface,

at said loading position, placing a pre-measured portion of said sticky material onto said separating means in said forming means and causing said separating means to serve as a protective barrier between said sticky material and said supporting surface,

at said forming position, pressing said pre-measured portion of sticky material into a cohesive mass and conforming said mass to the wall configuration of said forming means,

ejecting said cohesive shaped mass from said forming means through the open bottom thereof by using gravitational force by removing said supporting surface therefrom, and

while performing said sequential operation, causing said separating means and said supporting surface to slide in contact with and relative to each other while causing such separating means to remain stationary relative to said sticky material thereby causing said sticky material and supporting surface to slide relative to each other without said material sticking or adhering to said surface.

3,956,517
METHOD OF FORMING RIPPLED CHIP-TYPE PRODUCTS

Alan Dale Curry, Colerain Township, Hamilton County; Leon Levine, Cincinnati, and Dennis William Rose, Colerain Township, Hamilton County, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 13, 1974, Ser. No. 469,268
Int. Cl.² A21C 11/04; A21D 8/08; A23L 1/216
U.S. Cl. 426—502 15 Claims

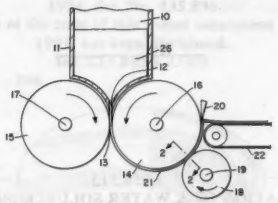
1. A method of forming chip-type products from a formulated dough material comprising

a. sheeting said formulated dough material to form a coherent workable dough sheet;

b. impressing a rippled configuration of substantially parallel arcuate ridges and grooves on only one surface of said dough sheet by passing said dough sheet through the nip of a pair of mill rolls, one of said rolls having a smooth surface and the other of said mill rolls having an annularly grooved surface;

c. removing said surface-configured dough sheet from said mill rolls.

d. cutting suitably shaped pieces from said surface-configured dough sheet; and

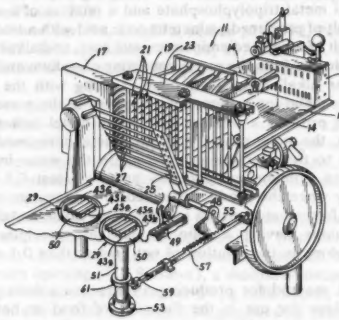


e. cooking said dough pieces thereby to provide a crispy chip-type product having a series of distinct and substantially parallel arcuate ridges and grooves extending across both surfaces which effect a rippled appearance to said chip-type product.

3,956,518
METHOD OF SLICING AND STACKING CHEESE

Raymond A. Goldbach, Marathon, Wis., assignor to Kraftco Corporation, Glenview, Ill.

Continuation of Ser. No. 260,287, June 6, 1972, abandoned.
This application Oct. 29, 1974, Ser. No. 518,180
Int. Cl.² A01J 27/00; B26D 7/06
U.S. Cl. 426—518 2 Claims



1. A method of preparing a stack of slices of cheese which are characterized as being tacky and which tend to adhere to the surfaces of adjacent slices and inhibit separation of the individual slices when in stacked substantially full surface contact therewith, said method facilitating separation of the stacked slices and comprising the steps of progressively feeding a bulk quantity of cheese to a slicing station, slicing said bulk quantity of cheese into a plurality of slices such that the opposite stacking surfaces of each slice are corrugated to define substantially straight parallel ridges and troughs, said slices each having substantially greater length and width than thickness, transferring each successive slice of cheese to a stacking station for deposit on the preceding slice, and positioning the stack of slices between transfer of each successive slice to said stacking station such that the ridges of the corrugations of each successive slice are disposed approximately 90° to the ridges of the adjacent slice surface so that only portions of the ridges of adjacent slices are in contact whereby to minimize surface contact between adjacent surfaces of the stacked slices.

3,956,519

PROCESS FOR AGGREGATING PROTEIN

Mervyn Thomas Arthur Evans, Ayot St. Lawrence; Malcolm Glyn Desmond Jones, Luton, and Norman Jones, Codicote, near Hitchin, all of England, assignors to Thomas J. Lipton, Inc., London, England

Filed Dec. 4, 1974, Ser. No. 529,465

Claims priority, application United Kingdom, Dec. 13, 1973, 57847/73; Apr. 4, 1974, 14986/74; Sept. 2, 1974, 38281/74; Nov. 19, 1974, 50032/74

Int. Cl.² A23G *9/02*; A23C *13/12*

U.S. Cl. 426—564 **9 Claims**

1. A process for aggregating protein which comprises preparing an aqueous solution of a protein, adding thereto a polysaccharide aggregating agent selected from the group consisting of debranched amylopectin and debranched low D.E. maltodextrin, and allowing the protein to aggregate.

3,956,520

PROCESS FOR MANUFACTURING CHEESE PRODUCT

Joseph A. Aiello, 7023 - 16th Ave., Brooklyn, N.Y. 11204

Continuation-in-part of Ser. No. 416,432, Nov. 16, 1973, abandoned, which is a continuation-in-part of Ser. No. 368,247, June 8, 1973, abandoned, which is a continuation-in-part of Ser. No. 218,482, Jan. 17, 1972, abandoned. This application May 17, 1974, Ser. No. 471,129

Int. Cl.² A23C *21/00*

U.S. Cl. 426—582 **19 Claims**

1. A process for making a cheese byproduct suitable for human consumption comprising neutralizing cheese whey to a titrable acidity of 0.10–0.12 percent, heating the resultant whey composition to a temperature of 180°–188°F., adding an acid substance to the whey composition in at least two steps while maintaining said whey composition in the temperature range 180°–188°F. so that cheese solids in the form of fine cheese flakes separate to the surface of the whey composition, said acid addition steps being spaced at at least 5 minute intervals, the amount of acid being sufficient so that the titrable acidity of the composition is about 1.35 to 1.55 percent, heating the cheese solids at the surface of the whey composition until the moisture content of said cheese solids is about 60–70 percent, drying said 60 70 percent moisture containing cheese solids to a moisture content of 20–30 percent and grating the dried cheese solids.

3,956,521

PROCESS FOR PRODUCING POWDER FROM MILK OR SIMILAR LIQUIDS

Jan Pisecky, and Vagn Westergaard, both of Tastrup, Denmark, assignors to Aktieselskabet Niro Atomizer, Soborg, Denmark

Filed Oct. 18, 1974, Ser. No. 515,956

Claims priority, application Germany, Oct. 22, 1973, 2352894

Int. Cl.² A23C *1/04*

U.S. Cl. 426—588 **11 Claims**

1. In a process for producing powder from liquids which when spray-dried form particles containing a substantial amount of vacuoles, such as milk, in which process the liquid, preferably in the form of a concentrate, is, by the use of a rotary atomizer in a first stage, spray-dried in hot gas into a moist powder which in a second stage is after-dried in hot gas in a fluidized bed to the moisture content of the final product desired, while the particles carried along are separated from the gas leaving the two stages, wherein the improvement comprises the steps of:

a. raising the temperature of the hot gas which is supplied to the first stage to at least 10°C higher than the highest temperature which would be permissible for the liquid in question if the spray drying for the production of the final product with the moisture content desired were to be performed in only one stage and with the same degree of heat damage,

b. spray drying in the first stage wherein the moisture content of the powder obtained from this stage, dependently on the liquid to be dried, is 2–15% higher than the desired moisture content in the final product and the highest value of which moisture content is determined with due regard to the fact that agglomeration shall be substantially avoided, and

c. separating the fine particles from the the gas and adding them to the main bulk of the powder produced after the latter has been dried to a moisture content of at the most 2–10%, so that the fine particles do not stick thereto to such an extent that stable agglomerates are formed.

3,956,522

MARGARINE FAT

Hans Robert Kattenberg, and Laurentius Adrianus Maria Verhagen, both of Vlaardingen, Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed Oct. 8, 1974, Ser. No. 513,196

Claims priority, application United Kingdom, Oct. 9, 1973, 47045/73

Int. Cl.² A23D *3/00*

U.S. Cl. 426—603 **5 Claims**

1. Margarine fat consisting essentially of a liquid oil containing at least 40% of polyunsaturated fatty acid radicals and 6–12% of a hard stock consisting essentially of:

i. 65–100% of a hard fat bottom fraction obtained by removing 5–50% of the higher melting constituents of a hard fat that prior to fractionation consisted of an interestified blend of two or more substantially completely hydrogenated fats, at least one being a hydrogenated lauric type fat of a melting point of 30°–40°C and at least one being a hydrogenated fat containing at least 50% of saturated fatty acids with 16–18 carbon atoms, the weight ratio of the hydrogenated lauric type fat to the hydrogenated fat containing at least 50% of fatty acids with 16–18 carbon atoms being (5–75):(95–25);

ii. 0–35% of a second hard fat of a melting point higher than that of the bottom fraction, said hard fat containing at least 50% of fatty acids with 16–18 carbon atoms.

3,956,523

NON-ELECTROSTATIC PRINTING METHOD EMPLOYING AN INSULATING IMAGE CARRIER

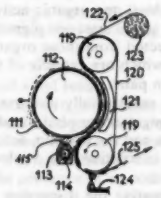
Marcus Cantarano, No. 47 Ave. F. Roosevelt, 94320 Thiais, France

Continuation of Ser. No. 151,488, June 9, 1971, Pat. No. 3,826,672, which is a continuation-in-part of Ser. No. 631,972, April 18, 1967, abandoned. This application Jan. 9, 1974, Ser. No. 431,959

The portion of the term of this patent subsequent to July 30, 1991, has been disclaimed.

Int. Cl.³ G03G *17/00*

U.S. Cl. 427—24 **4 Claims**



1. A method for producing electrographic images from an original provided with a conductivity pattern ranging from a portion having a greater conductivity to a portion having a lesser conductivity, said conductivity pattern being affixed to an insulating backing material, comprising the steps of coating

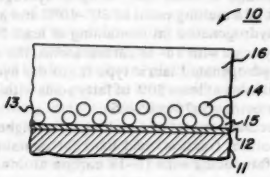
said conductivity pattern with a thin uniform layer of electrically chargeable particles, placing an insulating image carrier against said layer of electrically chargeable particles so that said layer of electrically chargeable particles is sandwiched between said conductivity pattern and said insulating image carrier, and generating an electric field of sufficient strength across said image carrier, said layer of electrically chargeable particles and said conductivity pattern so as to transfer electric charges from said conductivity pattern to said electrically chargeable particles whereby said particles receive electric charges having different maximum values according to the different conductivities of said portions of said conductivity pattern whereby a portion of said particles are sufficiently charged and removed from said conductivity pattern and the remainder of said particles are insufficiently charged so that they continue to remain on said conductivity pattern thereby producing thereon a first stable electrographic image and a second stable electrographic image is formed on said insulating image carrier from said particles removed from said conductivity pattern.

3,956,524

METHOD FOR THE PREPARATION OF ELECTROSTATOGRAPHIC PHOTORECEPTORS

John W. Weigl, West Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 4, 1974, Ser. No. 529,440
Int. Cl.² B05D 3/06, 5/12
U.S. Cl. 427—40 **20 Claims**



1. An improved method for the preparation of an electrostatographic photoreceptor comprised of a layer of an organic active transport material which comprises a polymer or non-polymeric material capable of supporting the injection of photoexcited holes or transporting electrons and allowing the transport of the holes or electrons through the layer to selectively dissipate a charge on the surface of the layer or an organic insulating material which is selected from those materials which have sufficiently high resistivity to retain an electrostatic charge overcoating a photoconductive, charge carrier generating material in operative connection with a conductive substrate which comprises:

a. selecting at least one organic active transport or insulating material and at least one pigmentary photoconductive material selected from those organic or inorganic photoconductors which are capable of the photogeneration of hole-electron pairs;

b. preparing a substantially uniform liquid dispersion containing the pigmentary photoconductive material as dispersed phase and the organic, active transport or insulating material in solution with a solvent therefore as carrier phase;

c. uniformly coating the dispersion onto a grounded conductive substrate in such a manner that the buildup of electrostatic fields in the dispersion is avoided;

d. exposing the liquid coating to a direct stream of corona ions or a high intensity DC electric field, without contacting its surface with an electrode, in order to cause separation of the two phases into a two layered structure with the layer of photoconductive material being deposited between the substrate and the organic material in solution; and

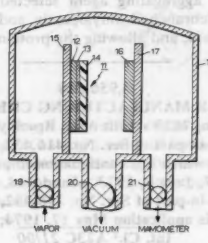
e. drying the layered structure by removing the solvent.

3,956,525

METHOD OF IMPROVING THE REUSABILITY OF AN ELECTROPHOTOGRAPHIC PHOTOSENSITIVE PLATE

Hiroshi Yasuba, Jyoyo, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed June 14, 1974, Ser. No. 479,574
Claims priority, application Japan, June 20, 1973, 48-70328
Int. Cl.² B05D 3/06
U.S. Cl. 427—41 **5 Claims**



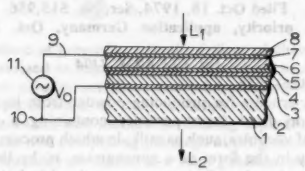
1. A method of suppressing residual charge buildup thus improving the reusablility of a selenium type electrophotographic photosensitive plate for use in a liquid electrophoretic development process, the plate comprising, in the following recited order, a base which is a conductive substrate, a thin vitreous sensitizing layer including selenium, an organic carrier transporting layer comprising a compound taken from the group consisting of polyvinylcarbazole and a polyvinylcarbazole derivative together with an inactive additive, said method comprising applying, by glow discharge in a vacuum chamber, a top organic film to said organic carrier transporting layer.

3,956,526

METHOD OF MAKING A PHOTOCONDUCTIVE LAYER FOR AN IMAGE CONVERTING PANEL

Nobumasa Ohshima, Hirakata; Kinya Himeno, Nara; Norihiro Tani, and Yoshio Enoki, both of Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed June 20, 1973, Ser. No. 371,661
Claims priority, application Japan, June 26, 1972, 47-64368
Int. Cl.² G03G 5/05; G01D 15/14
U.S. Cl. 427—73 **7 Claims**



1. A method of making a photoconductive layer for an image converting panel, comprising steps of: uniformly suspending photoconductive particles having an average diameter of 1 to 20 microns in a viscous solution by stirring for 15 seconds to 20 minutes, said viscous solution being kept at a temperature of 15° to 40°C and comprising a cellulose resin as a binder for combining said photoconductive particles and an organic solvent selected from the group consisting of toluene, xylene, n-butyl-acetate, ethyl alcohol, iso-amyl alcohol and iso-propyl alcohol, the concentration of said binder in said solution being 0.5 to 5 percent; putting an electrically conduc-

tive substrate, on which the photoconductive layer is to be formed, horizontally at the bottom of a container; pouring the stirred viscous mixture of said photoconductive particles, said binder and said solvent into said container; precipitating said photoconductive particles on the surface of said substrate in said viscous solution so as to form a wet photoconductive layer on said substrate; removing a clear solution on said wet photoconductive layer to the outside of said container; slowly drying said wet photoconductive layer in an atmosphere saturated by vapor of said solvent; and baking the dried photoconductive layer at a temperature of 60° to 160°C, the thickness of the photoconductive layer being 300 to 600 microns.

3,956,527

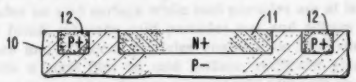
DIELECTRICALLY ISOLATED SCHOTTKY BARRIER STRUCTURE AND METHOD OF FORMING THE SAME

Ingrid E. Magdo, and Steven Magdo, both of Hopewell Junction, N.Y., assignors to IBM Corporation, Armonk, N.Y.

Division of Ser. No. 351,399, April 16, 1973, Pat. No. 3,858,231. This application Oct. 3, 1974, Ser. No. 511,898

Int. Cl.² H01L *5/02*; B05D *5/12*

U.S. Cl. 427—84 **7 Claims**



1. A method of forming a planar integrated circuit structure having Schottky Barrier contacts comprising:

forming a protective layer over discrete spaced areas in a silicon substrate having a planar surface, said protective layer comprising a dielectric material selected from the group consisting of silicon nitride and silicon dioxide,

thermally oxidizing the unprotected area in said substrate to form silicon dioxide regions surrounding said spaced silicon areas and substantially coplanar with said regions at said surface,

forming a layer of dielectric material on said surface,

forming at least one opening through dielectric layer to expose the entire surface of one of said discrete silicon areas having a maximum conductivity-determining impurity C_0 of 10^{16} atoms/cm³ and a portion of the surface of the silicon dioxide regions surrounding said discrete silicon area, and

depositing a Schottky Barrier-forming metallic layer in said opening to provide a Schottky Barrier contact with the entire surface of said silicon area, said metallic layer also overlapping said surrounding silicon dioxide regions.

3,956,528

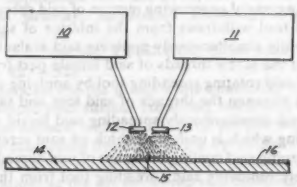
SELECTIVE PLATING BY GALVANIC ACTION

Josef V. Ugro, Jr., Mahtomedi, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 15, 1974, Ser. No. 524,046

Int. Cl.² B05D *5/12, 1/34, 1/36, 1/02*

U.S. Cl. 427—125 **13 Claims**



1. A method for depositing metal on a conductive substrate by galvanic action, comprising the steps of:

spraying the conductive substrate with a first spray of a liquid solution containing ions of the plating metal to be plated onto the conductive substrate; and

spraying the conductive substrate with a second spray comprising a mixture of (1) particulate driving metal having a particle size of about 1–100 microns and being less noble than said plating metal, and (2) an inert particular material having a particle size of about 5–500 microns, while allowing the two sprays to mingle on the conductive substrate and deposit a layer of said plating metal on the conductive substrate.

3,956,529

FINISHING PROCESS FOR FABRIC COVERED AIR FRAME STRUCTURE

Earl H. Addison, La Grange, Ill., assignor to Cooper Aviation Industries, Inc., Elk Grove Village and Hydrosol, Inc., Cicero, both of, Ill.

Filed Oct. 25, 1973, Ser. No. 409,384

Int. Cl.² B05D *1/38*; B64C *1/00*

U.S. Cl. 427—171 **4 Claims**

1. A method of producing an improved coated aircraft fabric which comprises the steps of first coating a smooth filament heat shrinkable polyester fabric which is tautened onto an air frame with at least one layer of an acrylic latex-containing composition comprising high molecular weight molecules in latex form drying the coating, applying onto said latex coated fabric at least one layer of an intermediate coating composition of a solution dope and drying, and then applying a finishing coat over the layer of said second coating composition, and drying.

3,956,530

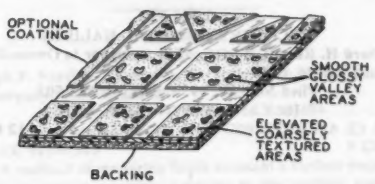
METHOD OF MAKING CHEMICALLY EMBOSSED SURFACE COVERINGS

Allan W. McKee, Jr., Millersville, and Jack H. Witman, Lancaster, both of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Nov. 19, 1974, Ser. No. 525,167

Int. Cl.² B05D *3/04, 3/10*; B32B *3/00*

U.S. Cl. 427—195 **14 Claims**



1. The process of forming a textured, embossed decorative surface covering which comprises preparing a dryblend containing

a. a vinyl resin,

b. a plasticizer for said vinyl resin,

c. a polymerizable monomer, compatible with the plasticized vinyl resin, said monomer containing at least two olefinically unsaturated sites, and, capable of addition polymerization at a temperature in the range of about 300° to 400°F in the presence of an addition polymerization catalyst, and

d. a catalyst that will cause polymerization of said monomer in said temperature range, depositing a layer of the dryblend on a backing, heating to form an unfused porous cohesive layer from said dryblend, applying to said porous layer in a predetermined pattern a printing composition containing a polymerization inhibitor that will prevent polymerization of said monomer in said temperature

range, and heating the resulting layer to said temperature range to fuse the resinous dryblend, and polymerize and cross-link said monomer in those portions of said dryblend not printed with said inhibitor-containing printing composition.

3,956,531
CHROMIUM OXIDE DENSIFICATION, BONDING, HARDENING AND STRENGTHENING OF BODIES HAVING INTERCONNECTED POROSITY

Peter K. Church, Cascade, and Oliver J. Knutson, Colorado Springs, both of Colo., assignors to Kaman Sciences Corporation, Colorado Springs, Colo.

Continuation-in-part of Ser. No. 642,704, June 1, 1967, abandoned, which is a continuation of Ser. Nos. 63,998, June 18, 1970, Pat. No. 3,734,767, and Ser. No. 694,303, Dec. 28, 1967, Pat. No. 3,789,096, and Ser. No. 7,948, Feb. 2, 1970, which is a division of Ser. No. 694,303,. This application Sept. 18, 1972, Ser. No. 290,153

The portion of the term of this patent subsequent to Mar. 16, 1993, has been disclaimed.

Int. Cl.² B05D *3/02*

U.S. Cl. 427—226 **50 Claims**

1. The method of densifying, hardening and strengthening of bodies and coatings having interconnected porosity which comprises the steps of:

impregnating a porous body with a solution of a soluble chromium compound capable of being converted to chromium oxide on being heated;

drying and curing said impregnated body by heating same to a temperature sufficient to convert the chromium compound in situ to chromium oxide; and,

repeating the impregnation and curing steps at least once to densify, harden and strengthen the body, wherein the body consists of a material which is comprised of an oxide; is insoluble in and non-adversely reactive with the solution of a chromium compound selected as an impregnant; and is inherently temperature stable to at least the minimum heat cure temperature employed in converting the chromium compound impregnant to chromium oxide wherein the chromium compound is a mixture of chromic acid and a chromate.

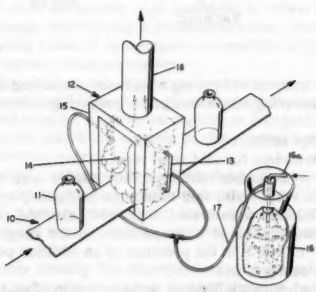
3,956,532
RECOVERY OF METAL HALIDES

Richard H. Russell, Adrian, Mich., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Nov. 29, 1974, Ser. No. 528,503

Int. Cl.² C01C *1/16*; C03C *17/22*

U.S. Cl. 427—226 **12 Claims**



1. In the process for scrubbing the effluent stream formed by pyrolyzing a metal halide selected from titanium halides or tin halides on a hot glass surface, said stream comprising moist air containing residual vaporous metal halide and the gaseous pyrolysis products of said metal halide, the improvement comprising:

admixing an amine with said stream to form a gaseous reaction mixture;

maintaining said gaseous reaction mixture at a temperature and for a time sufficient to form a solid reaction product;

separating said solid reaction product from said reaction mixture.

3,956,533
METHOD OF APPLYING A SEALANT TO PARTS TO BE CONNECTED

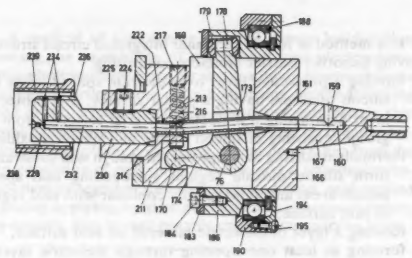
Günter Weber; Reinhold Speck; Stefan Forberger, all of Singen, Germany, and Josef Jusko, Schaffhausen, Switzerland, assignors to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Filed Sept. 26, 1973, Ser. No. 400,916

Claims priority, application Austria, Sept. 29, 1972, 8397/72; Switzerland, Mar. 29, 1973, 4569/73

Int. Cl.² B05D *7/22*

U.S. Cl. 427—236 **7 Claims**



1. A method for applying a sealant to a screw threaded female part that is to be connected by screwing to a male part in a gas- or liquid-type manner, comprising

moving a rotatable spreading tool, having a threaded shape on its outside surface which at least partially conforms to the threads on said female part, parallel to the axis of said female part from a resting position into an initial position within said female part, without effecting meshing of the threads;

radially adjusting the position of said spreading tool to effect meshing of threads of said spreader tool and said female part;

effecting a coaxial unscrewing motion of said spreading tool as said tool withdraws from the interior of said female part, while simultaneously applying said sealant in liquid form to the screw threads of said female part from openings in said rotating spreading tool by applying said liquid sealant between the threads of said tool and said female part, and simultaneously spreading said liquid sealant to a coating which is uniformly thick on said screw threads and shaping said coating be means of said spreading tool;

completely removing said spreading tool from the interior of said female part and returning said spreading tool axially and radially to its resting position; and

then allowing the sealing coating to harden to a uniform thickness.

3,956,534

METHOD OF SPRAY FORMING GLASS COATING ON CONCRETE BLOCKS

Earle C. Brown, Oakville, and J. Dennis Jones, Weston, both of Canada, assignors to Ontario Research Foundation, Sheridan Park, Canada

Filed Mar. 6, 1973, Ser. No. 338,631

Claims priority, application United Kingdom, Mar. 7, 1972, 10652/72

Int. Cl.² B32B 5/16

U.S. Cl. 427—243 11 Claims

1. A method of coating a surface of a concrete building element which comprises heating said surface to a temperature of at least 150°C, introducing glass particles into a flame comprising combusted gases at a high temperature and having a substantial velocity, said glass particles being formed from a glass having a fusion temperature of about 300° to about 500°C and a melting temperature of about 700° to about 1000°C and a coefficient of thermal expansion substantially that of said surface and less than 8×10^{-6} in/in/°C, fusing at least partially said glass particles, directing the flame containing said at least partially fused particles at said surface after completion of said heating of said surface, collecting said particles on said surface while said particles are at least partially fused, whereby said particles wet and adhere to said surface and adjacent particles coalesce on said surface to provide a glass film on said surface, sufficient glass being sprayed onto said surface to provide said film with an average thickness of about 0.1 to 0.8 mm, said film being porous, and rehydrating said surface after the formation of said glass film.

3,956,535

METAL PLATED OR PLATABLE ARTICLE

Gerald Scott Lozier, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 30, 1974, Ser. No. 437,961

Int. Cl.² C23C 3/02

U.S. Cl. 427—305 16 Claims

1. An article of manufacture comprising a body having a surface comprising a resin, said resin having incorporated therein the hydrolysis product of a hydrolyzable metal selected from the group consisting of titanium, aluminum, and zirconium, said hydrolysis product having adsorbed thereon either a metal or metal ion, said adsorbed metal or metal ion being a catalyst for the autocatalytic deposition of a metal from a solution containing salt of nickel or copper, a reducing agent, a chelating agent and a pH-adjusting agent.

3,956,536

SURFACE PRETREATMENT OF STEEL PRIOR TO ENAMELING

Rudolf Schoenemann, Dusseldorf-Holthausen, and Rudolf Reitzenstein, Traunreut, both of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany

Division of Ser. No. 303,512, Nov. 3, 1972, abandoned. This application Nov. 25, 1974, Ser. No. 526,626

Claims priority, application Germany, Nov. 5, 1971, 2154938

Int. Cl.² C23G 1/06; C23D 3/00

U.S. Cl. 427—328 10 Claims

1. A process for the direct-white enameling of a normal or decarburized steel surface consisting essentially of degreasing the metal surface; treating the metal surface with an aqueous solution containing from 0.1 to 5% by weight of at least one complex former which prevents the precipitation of heavy metal cations at the pH employed said complex former being selected from the group consisting of an alkali metal cyanide, an organic complex former and the mixtures thereof, intensively acid pickling the metal surface; nickelplating the metal surface; and direct-white enameling said nickelplated surface.

3,956,537

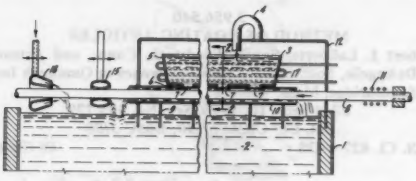
METALLIC COATING OF METAL TUBES AND SIMILAR WORK PIECES

Anthony John Raymond, 20429 Attica Road, Olympia Fields, Ill. 60461

Continuation-in-part of Ser. No. 350,535, April 12, 1973, Pat. No. 3,877,975. This application Apr. 22, 1974, Ser. No. 462,874

Int. Cl.² C23C 1/00; B05C 11/10, 3/02

U.S. Cl. 427—433 9 Claims



1. The method of continuously applying a molten metal coating to a metal tube or other work piece passing through the coating metal in a straight line within a housing, the housing having an entrance opening at one end to admit the work piece and an opening at the opposite end, comprising: heating the metal in a kettle to provide a body of liquid metal, pumping the molten metal into a reservoir within the housing disposed above said kettle, allowing a controlled stream of molten metal to flow downward from said reservoir, passing the work piece through the housing and beneath said reservoir to allow the molten metal to flow over and coat said work piece, disposing a splash plate at least beneath said work piece inside the housing to control the flow of molten metal around said work piece, said splash plate being extended at least to said opening at the opposite end of the housing to seal that opening, feeding the coated work piece through an adjustable sizing die outside the housing, and adjusting the sizing die longitudinally of the work piece and relative to the adjacent end of the splash plate to control the thickness of metal applied to the work piece.

3,956,538

FLAME RETARDATION

Joseph F. Vartiak, Naperville, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Oct. 29, 1974, Ser. No. 518,494

Int. Cl.² B05D 3/10; C09K 3/28

U.S. Cl. 427—343 5 Claims

1. A method of rendering flame resistant a surface susceptible to ignition comprising: applying to the surface, sequentially but not together, an aqueous solution of calcium chloride and an aqueous solution of sodium aluminate.

3,956,539

IMIDAZOLINES IN PREPARING FIBROUS ARTIFICIAL SAUSAGE CASINGS

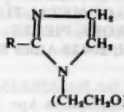
Merrill N. O'Brien, Jr., Danville, Ill., assignor to Tee-Pak, Inc., Chicago, Ill.

Filed Sept. 9, 1974, Ser. No. 504,212

Int. Cl.² B05D 3/00; A22C 13/00

U.S. Cl. 427—358 6 Claims

1. In a process for preparing a reinforced, artificial sausage casing comprising passing a tubular porous web through a die, impregnating the web with a polymeric dope introduced through said die and regenerating the polymer, the improvement which comprises employing a porous web having incorporated therein from about 25 – 500 ppm based on the weight of the porous web of an alkyl imidazoline ethoxylate of the formula:



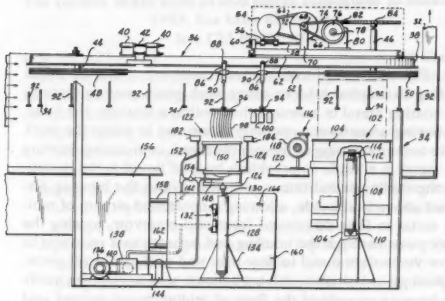
where R is a fatty acid radical having from 10 – 22 carbon atoms in the structure and x is a number from 3 – 10.

3,956,540

METHOD OF COATING ARTICLES

Albert J. Laliberte, South Woodstock, Conn., and Armand DeAngelis, Southbridge, Mass., assignors to Omnitech Inc., Southbridge, Mass.

Filed Sept. 10, 1973, Ser. No. 395,779
Int. Cl.² C03C 17/30; B05C 3/00
U.S. Cl. 427—430 18 Claims



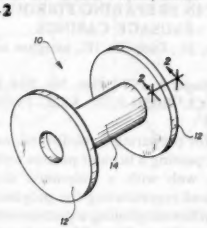
1. A method of applying a clear distortion-free scratch resistant coating of a synthetic resin to optical articles including the steps of maintaining a solution of said synthetic resin at a coating station, conveying articles to be coated from a location remote from said coating station to said coating station, stopping said articles at said coating station, first moving said articles at said coating station relative to said solution at a first controlled rate from a position out of said solution to a position immersed in said solution, and then moving said articles relative to said solution at a second controlled rate different from said first controlled rate to move said articles from said immersed position to said position out of said solution.

3,956,541

STRUCTURAL MEMBER OF PARTICULATE MATERIAL AND METHOD OF MAKING SAME

John Philip Pringle, Allen, Tex., assignor to Capital Wire & Cable, Division of U. S. Industries, Plano, Tex.

Filed May 2, 1974, Ser. No. 466,242
Int. Cl.² B65D 71/00; B32B 5/16
U.S. Cl. 428—2 8 Claims



1. A structural member comprising in combination:

a. a first component comprising a mixture of:
   1. 30 to 60 weight percent of particulate membeers of scrap thermoplastic wire and cable insulation material randomly distributed throughout said member; and
   2. 70 to 40 percent of particulate wood filler material filling the spaces between said thermoplastic members; and

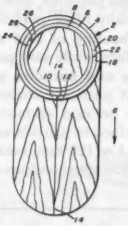
b. a second component added to said first component, comprising an effective quantity of thermosetting resin binder materials interattaching said thermoplastic and said wood filler materials to form a structural member.

3,956,542

MULTIPLE PLY WOOD ARTICLE AND METHOD

Barney Roberti, Mathews Run Road, Youngsville, Pa. 16371

Filed July 15, 1974, Ser. No. 488,327
Int. Cl.² B32B 3/20; F16L 9/14
U.S. Cl. 428—35 9 Claims



1. A multiple ply wood article comprising

a first wood veneer ply defining a generally tubular shape with a pair of confronting ends providing a first seam,

a second wood veneer ply defining a generally tubular shape generally similar to the shape of said first wood veneer ply with a pair of confronting ends providing a second seam,

said second wood veneer ply being disposed exteriorly of said first wood veneer ply in general surface to surface adjacency,

the orientation of said grains of said wood veneer plies being such that the smaller included angle between them is less than about 20°,

said wood veneer plies having an average thickness of about 1/32 to 5/16 inch,

adhesive means securing said first wood veneer ply to said second wood veneer ply to establish a multiple ply tubular body,

said multiple ply tubular body having no additional wood veneer ply secured directly thereto which does not have a grain oriented generally parallel with respect to the grain of said second wood veneer ply, and

said orientation of said grains being generally aligned with the longitudinal axis of said tubular body.

3,956,543

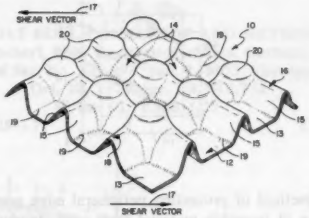
SHEAR FLEXIBILITY FOR STRUCTURES

Maynard L. Stangeland, Calabasas, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 294,403, Oct. 2, 1972, abandoned. This application Sept. 11, 1974, Ser. No. 504,927
Int. Cl.² B32B 3/30, 15/00
U.S. Cl. 428—36 4 Claims

1. A flexible member that will withstand shear vector translation up to 0.5 percent across said member comprising a flat sheet of metal formed with at least one pair of linearly extending intersecting convolutions at right angles to one another having a constant cross-section, the radius of said intersection convolution is 6 to 12 times the thickness of said sheet of metal, each of said convolution being substantially at a 45°

angle to a shear vector and shear translation imparted to said flat sheet of metal, the height of said intersecting convolution is 9 to 17 times the thickness of said sheet of metal, said intersecting convolution having a spherical domed region extending beyond the apex of each of said intersecting convolutions approximately equal to the height of said convolutions at the area of intersection, said spherical domed region serves to interrupt the principal stress lines that act along said apex



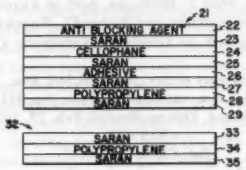
of each of said convolutions, when said flexible member is subjected to said shear vector translations, a wall portion of said constant cross-section intersecting convolutions is formed with a radius 3 to 5 times the thickness of the metal between said wall of said convolutions and a flat portion of said sheet of metal and a radius 3 to 5 times the thickness of the metal between said spherical domed region and said intersecting convolutions.

3,956,544

TUBULAR PACKAGE

Frank C. Harrington, Danville, Ill., assignor to Tee-Pak, Inc., Chicago, Ill.

Filed Nov. 6, 1974, Ser. No. 521,303
Int. Cl.² F16L *11/04;* **B32B** *1/08, 3/18*
U.S. Cl. 428—36 **3 Claims**



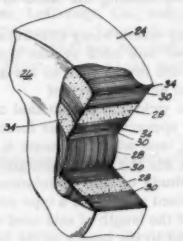
1. A duplex tubular mold particularly adapted for the packaging of food products which comprises a pair of curved separate films unadhered to each other over major contacting surfaces and heat sealed at the edges to form a duplex tube, the outer film of said tube being a laminate consisting of a first film ply of cellophane having a thickness of from about 0.8–1.6 mils and having saran coatings on the outer and inner surfaces and a second film ply consisting of biaxially oriented polypropylene having a thickness of from about 0.5–1.5 mils with saran coatings on the outer and inner surfaces, the saran coated cellophane ply and biaxially oriented polypropylene ply being adhesively laminated, at the inner surface of the said cellophane ply and the inner film of said tube being a laminate consisting of biaxially oriented polypropylene having a thickness of from about 0.5–1.5 mils coated with saran on both sides.

3,956,545

GLASS FIBER FRICTION ELEMENT

Frank D. Afflerbach, Levittown, Pa.; Irvin Barnett, Martinsville, and Walter B. Peters, South Orange, both of N.J., assignors to Johns-Manville Corporation, Denver, Colo.

Division of Ser. No. 252,119, May 10, 1972, Pat. No. 3,870,581. This application Dec. 23, 1974, Ser. No. 535,899
Int. Cl.² B32B *5/12, 5/16;* **B65H** *81/00;* **F16D** *69/00*
U.S. Cl. 428—37 **7 Claims**



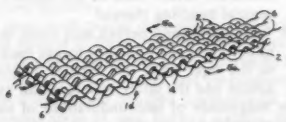
1. A friction element consisting essentially of an annular disc of glass strands bonded together with a cement, said disc having an inner annular edge, an outer annular edge, and generally flat surfaces extending intermediate said edges, said disc having one portion of said glass strands extending spirally from said inner edge to said outer edge and the other portion of said strands extending normal to said flat surfaces and dispersed throughout said disc.

3,956,546

ZERO DEGREE BELTED TIRES, AND HIGH SOFT STRETCH BELT-FORMING TAPES THEREFOR

James J. Neville, Kinnelon; Wesley Ferrell, Wayne, and Daniel Shichman, Cedar Grove, all of N.J., assignors to Uniroyal Inc., New York, N.Y.

Filed July 8, 1971, Ser. No. 160,675
Int. Cl.² D03D *11/00*
U.S. Cl. 428—43 **62 Claims**



1. A high "soft stretch" tape of reinforcing cord for a molded elastomeric article intended to undergo an expansion of at least about 20% after incorporation of the tape therein, comprising:

A. at least one reinforcing cord,

1. said cord having a multiplicity of undulations therein

2. which in any given straight length of the tape are substantially planar,
3. whereby the tape can be elongated, without any stretching of said cord, by straightening of the latter to remove said undulations therefrom, and
4. said cord being locally weakened at a multiplicity of longitudinally spaced portions thereof; and

B. relatively weak tying means
1. acting on said cord and
2. releasably holding the same in the undulating state thereof,
3. said tying means being constructed
a. to hold said cord against straightening out under moderate forces such as are applied to the tape in normal handling thereof
b. but to yield and permit said cord to straighten out under appreciably higher forces such as are applied to the tape when the same is incorporated in said article and the latter undergoes an expansion;

C. the magnitude of said undulations of said cord being predetermined to provide a tape stretch ratio, defined as the ratio of the length of said cord when unstretched but fully straight to the length of the tape when said cord is undulated, which is
1. at least about 1.2,
2. no greater than substantially equal to the expansion ratio of said article, defined as the ratio of a given dimension of said article after the same is expanded to the corresponding dimension of said article before the same is expanded, and
3. no smaller than said expansion ratio less approximately the capability of said cord to elongate by strain, by partial untwisting, and by rupture at said weakened portions.

48. A high "soft stretch" tape of reinforcing cord for a molded elastomeric article intended to undergo an expansion of at least about 20% after incorporation of the tape therein, comprising:

A. a plurality of reinforcing cords disposed in side by side relation,
1. each of said cords having a respective multiplicity of substantially identical undulations therein
2. which in any given straight length of the tape are substantially planar and both substantially parallel to and out of lateral alignment with the undulations of each next adjacent cord, with the plane of said undulations in each cord being substantially perpendicular to the two parallel planes which are tangent, respectively, to the top and bottom peaks of said cords,
3. whereby the tape can be elongated, without any stretching of said cords, by straightening of the latter to remove said undulations therefrom; and

B. relatively weak tying means
1. acting on said cords and
2. releasably holding the same in the undulating states and relative positions thereof,
3. said tying means being constructed
a. to hold said cords against straightening out under moderate forces such as are applied to the tape in normal handling thereof
b. but to yield and permit said cords to straighten out under appreciably higher forces such as are applied to the tape when the same is incorporated in said article and the latter undergoes an expansion;

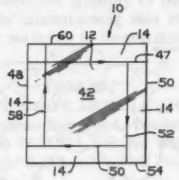
C. the magnitude of said undulations of said cords being predetermined to provide a tape stretch ratio, defined as the ratio of the length of each unstretched cord when fully straight to the length of the tape when said cords are undulated, which is
1. at least about 1.2, and
2. no greater than substantially equal to the expansion ratio of said article, defined as the ratio of a given dimension of said article after the same is expanded to the corresponding dimension of said article before the same is expanded.

3,956,547

METHOD OF MAINTAINING EDGE STRENGTH OF A PIECE OF GLASS

Robert P. DeTorre, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 30, 1974, Ser. No. 438,096
Int. Cl.² C03C *19/00*; C03B *21/02*; B26F *3/00*
U.S. Cl. 428—43 **20 Claims**



1. A method of protecting peripheral edge portions of a flat piece of frangible material from edge damage wherein the piece of frangible material has predetermined peripheral dimensions and one major surface having a predetermined surface area, comprising the steps of:

providing a flat sheet of frangible material having at least one peripheral dimension greater than a peripheral dimension of the piece and one major surface having a surface area greater than the surface area of the one major surface of the piece;

scoring the sheet at a first position a score line that is essentially free of wing or spall to provide the piece of frangible material with trim;

moving the piece of frangible material having trim to a second position; and

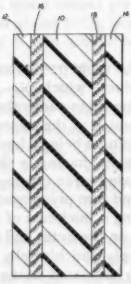
supporting the piece of frangible material having trim during movement to and/or at the second position by way of the trim thereby protecting the peripheral edge portions of the piece of frangible material from edge contacting forces.

3,956,548

DUO MATERIAL CARBON COMPOSITE BRAKE DISK

James J. Kovac; Mial T. Hillhouse, both of Akron; David M. Seikel, New Philadelphia, and Richard L. Ramsey, Akron, all of Ohio, assignors to Goodyear Aerospace Corporation, Akron, Ohio

Continuation-in-part of Ser. No. 426,568, Dec. 20, 1973, abandoned, which is a continuation of Ser. No. 351,258, April 16, 1973, abandoned. This application Feb. 27, 1975, Ser. No. 553,450
Int. Cl.² B32B *9/00*
U.S. Cl. 428—64 **16 Claims**



1. An integral duo carbon composite brake, disk comprising, a reusable carbon composite core, said composite core containing a laminate of a carbon cloth fiber and a high coking

value material pyrolized to yield essentially a carbon material, at least one carbon composite low wear layer, said low wear layer containing a laminate of a carbon cloth fiber and a high coking value material pyrolized to yield essentially a carbon material, at least one carbon felt layer bonded by a high carbon bearing cement to said core and said low wear layer to form the brake disk, and, said carbon cement pyrolized to form a carbon material so that an integral duo brake disk is formed.

3,956,549

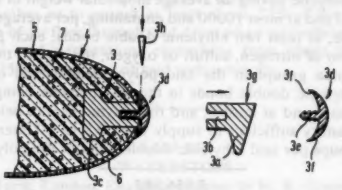
BOAT HULL CONNECTOR AND METHOD

Helmut Stoeberl, 8201 Eggstaett-Bachham, Germany

Division of Ser. No. 322,098, Jan. 9, 1973. This application Oct. 29, 1974, Ser. No. 518,752

Int. Cl.² B32B *3/26*

U.S. Cl. 428—71 **13 Claims**



1. A structural member comprising a pair of opposed molded plastics shells defining a cavity therebetween, plastics foam filling said cavity, peripheral edges of the opposed shells spaced from one another at a peripheral gap, a connector strip between the peripheral edges of said shells having a first edge portion exterior of the shell having at least one projection adapted to be anchored in the parting line of mold halves containing said shells, a second edge portion in said cavity between the shells anchored in said plastics foam and a connecting portion between said first and second edge portions closing the gap between the shells, and flaps carried by said connecting portion overlying the peripheries of the shells in tight sealing engagement therewith.

9. The method of making plastics foam-filled structural members which comprises molding plastic shells in opposed mold halves, providing a connector strip clamping the connector strip between the mold halves around an outer edge portion of the strip while projecting an inner edge portion of the strip into the cavity between the shells in the molds, filling the cavity between the shells in the molds with plastics foam and simultaneously anchoring the portion of the strip in the cavity securely in the foam, removing the foam-filled unit from the mold halves, severing the portion of the strip projecting from the shells, and sealing the peripheral edges of the shells with flaps carried by the strip.

3,956,550

COMPOSITE CLOSURE MEMBER

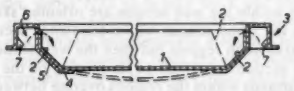
Brian Leo Chudleigh Sutch, Thames Ditton, England, assignor to Airfix Industries Limited, London, England

Filed Dec. 27, 1973, Ser. No. 428,854

Claims priority, application United Kingdom, Jan. 1, 1973, 45845/73; Mar. 22, 1973, 14018/73

Int. Cl.² B23B *3/02*; B29C *27/00*; B65D *5/64*

U.S. Cl. 428—81 **8 Claims**



1. A composite closure member comprising a generally planar blank of sheet material having a marginal part contiguous to the planar part of the blank angularly displaced out of the plane of the blank, a continuous rim of substantially rigid injection moulded thermo-plastic material surrounding the displaced marginal part of the blank, and said planar part of the blank being bowed upon shrinkage by the bonded displaced marginal part of the blank.

3,956,551

DUST COLLECTION MATS

Ernest Levon Richards, LaGrange, Ga., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed Sept. 16, 1974, Ser. No. 506,352

Int. Cl.² D03D *27/00*; D04H *11/00*; D05C *17/00*

U.S. Cl. 428—88 **2 Claims**

1. A dust control mat comprising: a sheet of textile material, a plurality of tufts of yarn connected thereto, a latex material coated to said sheet material holding said yarn tufts in said sheet material, a calendered rubber sheet laminated to said latex material and a narrow, resilient, knit reinforcing strip located between said latex material and said calendered rubber sheet with the elongated dimension being substantially perpendicular to the grain direction of said calendered rubber material, said reinforcing strip being shorter than the calendered rubber sheet and said sheet material in the length of the mat perpendicular to the grain direction of the calendered rubber sheet and being located adjacent one edge of said calendered rubber sheet.

3,956,552

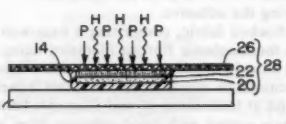
FLOCKED HEAT TRANSFER METHOD, APPARATUS AND ARTICLE

Joseph E. Geary, Rochester, N.Y., assignor to Champion Products Inc., Rochester, N.Y.

Filed May 5, 1975, Ser. No. 574,749

Int. Cl.² B05D *1/14*, *1/16*; B32B *33/00*

U.S. Cl. 428—88 **19 Claims**



1. A method for making a flocked heat transfer comprising the steps of:

a. applying a layer of heat-curable adhesive in a pattern on a thermoplastic film to form an adhesive pattern thereon;

b. applying flocking material to said adhesive pattern to form a flocked pattern;

c. placing an open mesh carrier over said thermoplastic film and flocked pattern to form a sandwich structure;

d. transferring said flocked pattern to said carrier by heating said sandwich structure to liquify said thermoplastic film and vacuum drawing said liquified thermoplastic film, in the background areas of said flocked pattern, into the mesh of said carrier to impregnate said carrier with said thermoplastic film such that substantially no thermoplastic film is left on the surface of said carrier in the background areas of said flocked pattern that can subsequently re-transfer to a receiving surface when the flocked heat transfer is applied to a final receiving surface by the application of heat.

17. A flocked heat transfer comprising an open mesh carrier, a flocked pattern on one surface of said carrier, and a

layer of thermoplastic film overlaying only the flocked pattern and being vacuum impregnated into the open mesh carrier in the background areas of the pattern.

3,956,553
FLOCKED FABRICS AND A PROCESS FOR MAKING THEM

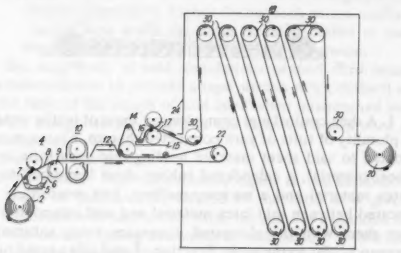
Bryan Albert Palmer, and Michael Frank Culpin, both of Pontypool, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Feb. 5, 1973, Ser. No. 329,332

Claims priority, application United Kingdom, Feb. 7, 1972, 5491/72

Int. Cl.² B05D *1/14, 1/16;* B32B *33/00*

U.S. Cl. 428—90 **12 Claims**



1. A process for making a substantially lint-free flocked fabric comprising sequentially the steps of

a. forming a base-web comprising non-woven thermoplastic fibrous material,

b. treating the base-web to bond together said nonwoven fibrous material thereby forming a bonded base-web,

c. applying to the bonded base-web a uniform amount of adhesive as a solution, emulsion or suspension of 1 part of an adhesive to 1–4 parts liquid,

d. applying flock fibres to the adhesive so that said flock fibres adhere to the fibrous material of the base-web,

e. drying the adhesive,

f. immersing the base-web and adhered flock fibres in a solution, emulsion or suspension containing 1 part of an adhesive to 4–40 parts of liquid, and

g. drying the adhesive.

7. A flocked fabric, comprising a base-web of non-woven bonded thermoplastic fibrous filaments being coated with a uniform amount of adhesive in a first dilute solution, emulsion or suspension to which flock fibres are adhered, said flock fibres and at least some of said filaments being substantially completely coated with dried adhesive from a second dilute solution, emulsion or suspension having a concentration of adhesive between one quarter and one tenth of the concentration of the adhesive in said first dilute solution, emulsion or suspension.

3,956,554
COATING FIBROUS SUBSTRATES

Heinz Abel, Reinach, Basel-Land; Melvin Harris, Dornach, both of Switzerland, and Derek James Rowland Massy, Cambridge, England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 30, 1973, Ser. No. 392,924

Claims priority, application United Kingdom, Sept. 1, 1972, 40648/72

Int. Cl.² D04H *11/00;* B05D *3/00*

U.S. Cl. 428—95 **17 Claims**

1. A process for backing a carpet consisting of

1. applying to the back of the carpet a curable composition comprising

i. a polymercaptan having a molecular weight of at least 182 and at most 10,000, containing two to six mercaptan groups per average molecule,

ii. a polyene having an average molecular weight of at least 250 and at most 10000 and containing, per average molecule, at least two ethylenic double bonds, each β to an atom of nitrogen, sulfur, or oxygen, the sum of the mercaptan groups in the said polymercaptan and of such ethylenic double bonds in the said polyene being more than 4 but at most 8, and the polymercaptan being in a quantity sufficient to supply from 0.8 to 1.1 mercaptan groups per said ethylenic double bond of the polyene, and

2. curing the composition on the back of the carpet without the application of heat or heating to a temperature of 80° to 130°C.

17. Carpets having a backing which is a cured composition comprising

i. a polymercaptan having a molecular weight of at least 182 and at most 10,000, containing two to six mercaptan groups per average molecule, and

ii. a polyene having an average molecular weight of at least 250 and at most 10000 and containing, per average molecule, at least two ethylenic double bonds, each β to an atom of nitrogen, sulfur, or oxygen, the sum of the mercaptan groups in the said polymercaptan and of such ethylenic double bonds in the said polyene being more than 4 and at most 8, and the polymercaptan being in a quantity sufficient to supply from 0.8 to 1.1 mercaptan groups per said ethylenic double bond of the polyene.

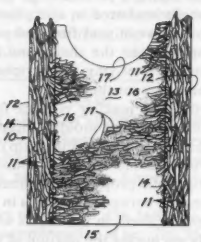
3,956,555
LOAD CARRYING MEMBER CONSTRUCTED OF ORIENTED WOOD STRANDS AND PROCESS FOR MAKING SAME

Herbert B. McKean, Lewiston, Idaho, assignor to Potlatch Corporation, San Francisco, Calif.

Filed Sept. 23, 1974, Ser. No. 508,205

Int. Cl.² B32B *5/12*

U.S. Cl. 428—106 **14 Claims**



1. An elongated structural beam member having a width dimension between longitudinal planar side edges and a thickness dimension between longitudinal planar faces joining the side edges, comprising:

overlapping elongated wood strands bonded together by a bonding resin forming a single integral elongated structural member;

said integral elongated structural member having spaced longitudinal tension-compression flange sections extending along said side edges between the planar faces in which the overlapping elongated wood strands within said flange sections are oriented parallel to each other and extend in the longitudinal direction of the member;

an integral web section between the flange section and the planar faces in which the overlapping elongated wood strands within the web section are oriented skewed relative to the wood strands within the flange sections; and

integral transition regions between the web section and the flange sections in which (1) a portion of the elongated wood strands within the regions overlap between the web section and the flange sections, (2) a portion of the elongated wood strands within the regions are parallel with the strands within the web section, and (3) a portion of

the elongated wood strands within the regions are parallel with the strands within the flange sections.

3,956,556

ARTICLE FOR CONDITIONING FABRICS IN A CLOTHES DRYER

Agnes R. McQueary, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 3, 1973, Ser. No. 347,606

The portion of the term of this patent subsequent to Mar. 4, 1992, has been disclaimed.

Int. Cl.[2] B32B *3/10*

U.S. Cl. 428—131 5 Claims

1. A fabric conditioning article comprising a flexible web substrate carrying a non-soap fabric-conditioning agent removable to fabrics by contact therewith in a laundry dryer, said web substrate containing perforations sufficient in size and number as to permit at least about 75% of the normal volume of air flow through said dryer when said article is used therein; said perforations comprising from about 0.5% to about 75% of the area of said web substrate.

3,956,557

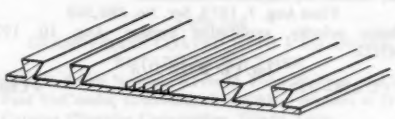
WATERSTOPS

John Hurst, London, England, assignor to W. R. Grace & Co., Cambridge, Mass.

Continuation of Ser. No. 217,676, Jan. 13, 1972, Pat. No. 3,758,650, which is a continuation of Ser. No. 4,379, Jan. 20, 1970, abandoned. This application Feb. 1, 1973, Ser. No. 328,791

Int. Cl.[2] B32B *3/30*

U.S. Cl. 428—167 7 Claims



1. A waterstop of the type used to provide a water seal at a face of a concrete joint formed by two adjacent and separately poured masses of concrete, said waterstop comprising a strip of moisture or water-resistant flexible material, said strip having a longitudinally extending center line and at least one keying formation projecting laterally from said strip on each side of the center line thereof, said keying formations all projecting from the same face of said strip and running longitudinally along the length thereof, said keying formations being structured such that the formations broaden out from the point at which they project from said strip, said strip further having substantially at said center line an easily deformable section of about 1–2 inches in width comprising a plurality of upstanding ribs formed of moisture and water-resistant flexible material, each of said ribs is of a rectangular cross-section, about 1/32 to ¼ inch thick and about ¼ to ⅜ inch high, and separated from each other by a distance of 1/16 to ⅜ inch and running longitudinally along the length of said strip and projecting laterally from the same surface as said keying formations, each of said ribs further being of sufficient deformability that the rib will easily fold over and conform to the configuration of stop-end shuttering placed thereon during the formation of said separately poured masses of concrete.

3,956,558

CERAMIC DECALCOMANIA AND METHOD

Louis A. Blanco, Tuckahoe, N.Y., and William F. Wenning, Beaver Falls, Pa., assignors to Commercial Decal, Inc., Mount Vernon, N.Y.

Continuation-in-part of Ser. No. 303,619, Nov. 3, 1972, abandoned. This application Jan. 24, 1975, Ser. No. 543,733

Int. Cl.[2] C03C *1/00, 3/00, 3/10, 3/12*

U.S. Cl. 428—204 8 Claims

1. An overglaze decalcomania comprising a backing sheet, a design layer disposed on the backing sheet and a protective layer of low melting point tin oxide-containing glass comprising from about 10 to about 50% by weight lead oxide, from about 15 to about 65% by weight silicon dioxide, from about 1 to about 10% by weight cadmium oxide, from about 1 to about 15% by weight tin oxide, and from about 0.5 to about 10% by weight titanium dioxide, so that after the decalcomania is applied to a vitreous surface and the assemblage fired, the protective layer of low melting point glass fuses and tightly binds the design layer to the vitreous surface, forms a protective coating on the vitreous surface which is resistant to acid attack and inhibits lead and/or cadmium release from the design layer and does not mask the color of the design layer.

8. A method for preparing an overglaze decalcomania which comprises applying a design layer to a backing sheet, and applying a protective coating of low melting glass over the design layer, said glass comprising from about 10 to about 50% by weight lead oxide, from about 15 to about 65% by weight silicon dioxide, from about 1 to about 10% by weight cadmium oxide, from about 1 to about 15% by weight tin oxide and from about 0.5 to about 10% by weight titanium dioxide firing the assemblage to fuse the protective coating and form a layer which does not mask the color of the design layer.

3,956,559

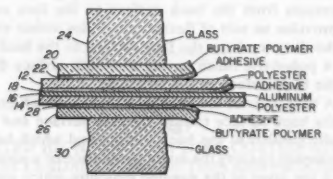
SOLAR CONTROL SAFETY WINDOW

Michael E. Wildorf, Malden, Mass., assignor to Material Distributors Corporation, Woburn, Mass.

Continuation of Ser. No. 235,152, March 16, 1972, abandoned. This application July 17, 1974, Ser. No. 489,157

Int. Cl.[2] B32B *17/08;* B60J *1/06, 3/00;* B32B *15/08*

U.S. Cl. 428—214 1 Claim



1. A solar control safety window comprising, in laminated sequence, a first glass sheet, a first outer polymer stratum of cellulose acetate butyrate, a first inner polymer stratum composed of polyethylene terephthalate, a vapor deposited aluminum stratum, a second inner polymer stratum composed of polyethylene terephthalate, a second outer polymer stratum of cellulose acetate butyrate, at least one bonding stratum interposed between said first inner polymer stratum and said vapor deposited stratum, and a second glass sheet, each of said first inner polymer stratum and said second inner polymer stratum ranging in thickness from ¼ to 1 mil, each of said first outer polymer stratum and said second outer polymer stratum ranging in thickness from 1 to 5 mil, said vapor deposited aluminum stratum being partially light reflecting and partially light absorbing and being characterized by a light transmission ranging from 5% to 60%, each of said glass sheets ranging in thickness from ⅛ to ½ inch, said solar control safety window

being optically clear, said first glass sheet and said first outer polymer stratum being in direct contact, said second glass sheet and said second outer polymer stratum being in direct contact, at least one of said inner polymer strata being optically clear and containing an ultraviolet absorption agent, a second bonding stratum being interposed between said first outer polymer stratum and said first inner polymer stratum and a third bonding stratum being interposed between said second outer polymer stratum and said second inner polymer stratum, all three bonding strata being cast from a solvent solution of a polyester or an acrylic polymer and ranging in thickness from 0.0001 to 0.0003 inch.

3,956,560

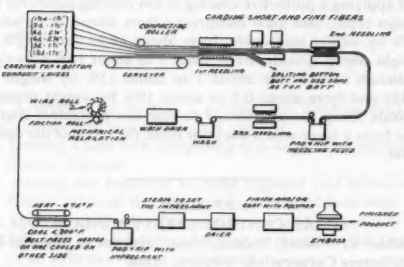
SMOOTH SURFACED TEXTILE FABRIC

Alexander M. Smith, II, Elkin, N.C., assignor to The Fiberwoven Corporation, Elkin, N.C.

Continuation-in-part of Ser. No. 221,614, Jan. 28, 1972, Pat. No. 3,817,820. This application June 5, 1974, Ser. No. 476,565

Int. Cl.² B32B *5/06*

U.S. Cl. 428—218 **39 Claims**



1. An artificial leather fabric comprising:

1. A needled structure of coherently entangled textile fibers of at least 8 pounds per cubic foot overall bulk density and wherein the needled structure has a back surface and a face surface with a bulk density gradient which increases from the back surface to the face surface and provides an axis of flexure which lies within about 0.4 of the distance from the face surface to the back surface;
2. A polymeric finish having a smooth surface disposed on the face surface of the structure;
3. A base layer of the needled structure which extends from the back surface toward the face surface and lies generally parallel to the back surface and which base layer is adapted to carry the major proportion of a planar loading;
4. A top layer of the needled structure which extends from the face surface toward the back surface and lies generally parallel to the face surface and which top layer is adapted to carry only a minor proportion of a planar loading; and
5. The base layer and the top layer being connected by connecting fibers having segments disposed in each of the said layers, and said connecting fibers only loosely connect the top layer to the base layer.

3,956,561

NONWOVEN ELECTRICAL INSULATION BASE FABRICS

Gary C. Anderson, Framingham, and Loyd G. Kasbo, Sherborn, both of Mass., assignors to The Kendall Company, Walpole, Mass.

Filed Mar. 14, 1975, Ser. No. 558,321

Int. Cl.² B32B *27/02*

U.S. Cl. 428—288 **3 Claims**

1. A nonwoven fabric comprising a major portion of non-fusible aramid fibers in which both the amino groups and the carboxy groups are attached to an aromatic ring,

bonded by a minor portion of thermoplastic polyamide fibers,

said fabric being characterized by resistance to significant shrinkage and resistance to thermal degradation at a temperature of over 500°F.

3,956,562

ELECTROSTATIC RECORDING MATERIAL

Kazuo Shibata, Nishinomiya, and Tadashi Tanimoto, Amagasaki, both of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan

Filed Mar. 5, 1974, Ser. No. 448,373

Claims priority, application Japan, Mar. 10, 1973, 48-28292

Int. Cl.² B32B *5/28, 5/16*

U.S. Cl. 428—323 **12 Claims**

1. An electrostatic recording material consisting essentially of an electrically conductive substrate and a dielectric layer formed on a surface thereof, said dielectric layer being essentially formed with an insulating polymeric material and pigment particles, said pigment particles having an average particle size of about 0.5 to 10 $\mu\phi$, said pigment particles carrying thereon a surface treating agent which is a member selected from the group consisting of fatty acids having at least 5 carbon atoms, polyhydric alcohol esters of said fatty acids, ammonium salts and metal salts of said fatty acids, resin acids, metal salts of said resin acids and mixtures of the foregoing.

3,956,563

ASSEMBLY FOR APPLYING THIN DAMPING LAYERS IN BUILDING STRUCTURES

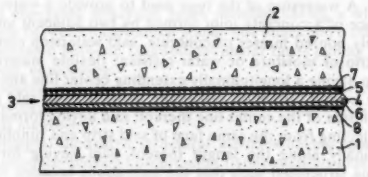
Kjell K. I. Spang, Vallingby; Gunnar I. Hagbjer, Stockholm; Jan Werner, Jarfalla; Goran R. Gadefelt, Farsta, and Bo M. S. Egerborg, Ekero, all of Sweden, assignors to Akustikbyran AB, Stockholm, Sweden

Filed Aug. 7, 1973, Ser. No. 386,360

Claims priority, application Sweden, Aug. 10, 1972, 10387/72

Int. Cl.² B32B *5/16*

U.S. Cl. 428—327 **4 Claims**

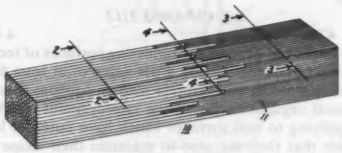


1. A prefabricated article for applying thin damping layers in building structures which comprises a backing strip, a thin damping layer of viscoelastic material on both sides of the backing strip and, on at least one of the damping layers, a layer of granular material embedded in and protruding from the viscoelastic layer and providing a surface receptive to bonding with a building material to be cast thereagainst.

3,956,564
GRADED FILAMENTARY COMPOSITE ARTICLE AND METHOD OF MAKING

William B. Hillig, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 382,487, July 25, 1973, abandoned. This application July 28, 1975, Ser. No. 599,886
Int. Cl.² B32B 9/00; D02G 3/00
U.S. Cl. 428—366 3 Claims



1. A graded filamentary elongated composite article having a substantially uniform cross-sectional area over its entire length comprising a plurality of densely packed unidirectional elongated high strength reinforcing filamentary material with varying lengths selected from the group consisting of polybenzimadazoles fibers, steel fibers, boron fibers, silicon carbide, fibers, carbon fibers, and carbon coated silicon dioxide fibers, a second plurality of different densely packed unidirectional elongated high strength reinforcing filamentary material of varying lengths selected from the group consisting of polybenzimadazoles fibers, steel fibers, boron fibers, silicon carbide, fibers, carbon fibers, and carbon coated silicon dioxide fibers, both pluralities of elongated high strength reinforcing filamentary materials arranged in the same direction and of similar cross-sectional area with ends of the varying lengths of opposite high strength reinforcing filamentary pluralities in contact and substantially free of overlap with respect to each other, and a thermosetting binder holding the high strength reinforcing filamentary materials in parallel relationship.

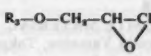
3,956,565
GLASS FIBERS COATED WITH A SILANIZED BUTADIENE POLYMER

Charles E. Bolen, Newark; Kevin M. Foley, Hebron, and Frank Paul McCombs, Granville, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

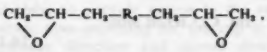
Continuation of Ser. No. 347,298, April 2, 1973, abandoned. This application Nov. 15, 1974, Ser. No. 524,112
Int. Cl.² B32B 9/00; D02G 3/00
U.S. Cl. 428—378 18 Claims

1. Glass fibers having a coating thereon, said coating comprising a polybutadiene prepared by first reacting a butadiene homopolymer or copolymer having an average molecular weight less than 6000 and containing at least 1.5 carbon-to-carbon double bonds per 1000 carbon atoms with a halosilane having the formula

wherein X is halogen and R is selected from the group consisting of halogen, hydrogen and an organic group, in the presence of a catalyst capable of causing addition of an H-Si group across an ethylenic double bond, the amount of the halosilane being sufficient to constitute one mole of halosilane per mole of carbon-carbon double bond in the homopolymer or copolymer, said amount being within the range of 0.1 to 50 parts by weight of halosilane per 10 parts by weight of the homopolymer or copolymer, and reacting the product with an epoxide selected from the group consisting of an alkylene oxide, an epoxide having the formula



wherein R_3 is an organic group, a diepoxide having the formula



a cyclohexane epoxide and mixtures thereof, with the amount of the epoxide being sufficient to react with all of the halogen atoms bonded to the silicon atoms.

3,956,566
METHOD FOR BONDING POLYAMIDES TO RUBBER, ADHESIVE FOR THE SAME, AND ADHESIVE COATED POLYAMIDE REINFORCING ELEMENTS

Gerard E. van Gils, Tallmadge, and Edward F. Kalafus, Akron, both of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 380,937, July 19, 1973, Pat. No. 3,888,805, which is a continuation-in-part of Ser. No. 310,524, Nov. 29, 1972, abandoned. This application Dec. 9, 1974, Ser. No. 530,649
Int. Cl.² D02G 3/00
U.S. Cl. 428—375 10 Claims

1. A polyamide reinforcing element containing from about 0.5 to 7% by dry weight based on the weight of said element of a heat cured adhesive composition useful for adhering said element to a rubber compound and comprising essentially 100 parts by weight of a rubbery vinyl pyridine copolymer, from about 2 to 28 parts by weight of trimethylol phenol and from about 0.5 to 24 parts by weight of at least one water soluble, thermoplastic and non heat hardenable resorcinol compound selected from the group consisting of resorcinol and a resorcinolformaldehyde novolak.

3,956,567
INSULATED HIGH VOLTAGE WIRE COATED WITH A FLAME RETARDANT COMPOSITION AND PROCESS OF PREPARING THE SAME

Joseph J. Krackeler, Los Altos Hills, and William G. Biddell, San Mateo, both of Calif., assignors to National Distillers and Chemical Corporation, New York, N.Y.

Division of Ser. No. 337,982, March 5, 1973. This application Jan. 30, 1975, Ser. No. 545,266
Int. Cl.² B32B 15/00; B05D 3/02; D02G 3/00
U.S. Cl. 428—379 7 Claims

5. An insulated high voltage wire coated with a flame retarded polymeric composition comprising

a. about 45 to 85% of polymeric components comprising about 15 to 60% high density polyethylene and about 40 to 85% low density polyethylene;

b. fire retardant components comprising about 2 to 30% by weight 1,2,3,4,6,7,8,9,10,10,11,11-dodecachloro-1,4,4a,5a,6,9,9a,9b-octahydro-1,4,6,9,-dimethanodibenzofuran and about 2 to 30% by weight 5-(tetrabromophenyl)-1,2,3,4,7,7,-hexachloro-norbornene in a parts by weight ratio of 1/1 to 1/1.86, respectively; and

c. about 10 to 40% by weight of an antimony compound.

3,956,568

CARBON-METAL COMPOSITE MATERIAL

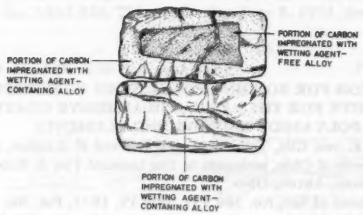
Toyonosuke Kanemaru, Zushi; Hiroshi Yamazoe, Tokyo, and Hiroshi Ichikawa, Yokohama, all of Japan, assignors to Nippon Carbon Co. Ltd., Tokyo, Japan

Filed Mar. 6, 1974, Ser. No. 448,471

Claims priority, application Japan, Mar. 12, 1973, 48-28058

Int. Cl.² B32B 9/00

U.S. Cl. 428—408 16 Claims


PORTION OF CARBON IMPREGNATED WITH WETTING AGENT-CONTAINING ALLOY
PORTION OF CARBON IMPREGNATED WITH WETTING AGENT-FREE ALLOY
PORTION OF CARBON IMPREGNATED WITH WETTING AGENT-CONTAINING ALLOY

1. A process for the preparation of a carbon-metal composite material for sliding members, comprising impregnating carbon with an alloy consisting essentially of a metal selected from the group consisting of copper, nickel and copper-nickel alloys as a base metal and at least one member selected from the group consisting of titanium and zirconium as a wetting agent for the carbon.

3,956,569

PROCESS FOR THE SURFACE TREATMENT OF SYNTHETIC RESIN SHAPED ARTICLES WITH ALKYL HYPOHALITES

Yoshio Jyo, Yokohama, and Kyouzi Inokuchi, Kawasaki, both of Japan, assignors to Nippon Zeon Co., Ltd., Japan

Filed Feb. 22, 1974, Ser. No. 444,968

Claims priority, application Japan, Feb. 27, 1973, 48-23516

Int. Cl.² B32B 27/36, 27/37

U.S. Cl. 428—412 7 Claims

1. A process for the surface treatment of a synthetic resin shaped article comprising contacting the surface of said article with a solution of at least one alkyl hypohalite in an organic solvent, said alkyl hypohalite being selected from the group consisting of butyl hypohalites and amyl hypohalites, the synthetic resin being a member selected from the group consisting of homopolymers of a monomer which is ethylene, propylene, styrene, vinyl chloride, methylmethacrylate or acrylonitrile, copolymers of at least two of said monomers, copolymers of at least one said monomer and a vinyl monomer, a mixture of one said resin and an ethylenically unsaturated polymer, polycarbonates, polyamide resins, polyether resins, polyester resins, phenol resins, urea-formalin resins, melamine-formalin resins, epoxy resins, acrylonitrile-butadiene-styrene resins, methacrylonitrile-butadiene-styrene resins, high impact polystyrenes and mixtures thereof.

3,956,570

METHOD FOR IMPARTING WATER-REPELLENCY TO CONSTRUCTION MATERIALS

Erhard Bosch, Burghausen; Karl Braunsperger, Raitenhaslach; Herbert Gluck, Burghausen; Ewald Pirson, Burghausen, and Michael Roth, Burghausen, all of Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed Sept. 19, 1973, Ser. No. 398,884

Claims priority, application Germany, Sept. 19, 1972, 2245927

Int. Cl.² C08J 3/12

U.S. Cl. 428—446 4 Claims

1. An improved process for rendering surfaces of inorganic construction materials having a pH value of at least 8 water repellent by treating said surfaces with an aqueous solution of alkali metal organosiliconates, the improvement which comprises applying to said surfaces which have cured at least to the extent that they are able to maintain their shape in the absence of a support, a solution containing a mixture of alkali metal organosiliconates in which at least 10 percent by weight based on the weight of the mixture of alkali metal organosiliconates are alkali metal propylsiliconates.

3,956,571

METHOD FOR MAKING ELECTROSTATIC RECORDING SHEET AND RESULTING PRODUCT

Katsuji Takao, Nishinomiya, and Koji Otsubo, Kobe, both of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan

Filed July 1, 1975, Ser. No. 592,181

Claims priority, application Japan, July 4, 1974, 49-77090

Int. Cl.² B05D 5/12

U.S. Cl. 428—513 8 Claims

1. A method for making an electrostatic recording sheet comprising:

coating the opposite surfaces of a paper sheet with an electroconductive coating composition essentially consisting of at least one cationic polymer electroconductive agent and at least one cationic sizing agent to form electroconductive layers,

further coating one of said electroconductive layers with an anionic coating composition to form a dielectric recording layer with incidental formation of a thin penetration resist layer between said electroconductive layer and said dielectric recording layer,

said anionic coating composition consisting essentially of an anionic aqueous dispersion including

a. 100 parts by weight of at least one water-insoluble polymer prepared from at least one monomer selected from the group consisting of ethylenic monomers, such as olefines, aromatic vinyl compounds, alkylacrylates, alkylmethacrylates and vinyl halides, and conjugated diolefinic monomers, and

b. 20 to 200 parts by weight of at least one water-soluble salt of polymer containing one carboxyl groups,

and said penetration resist layer being formed of a gelated material produced by an ionic reaction on contact of said anionic aqueous dispersion with said cationic electroconductive layer.

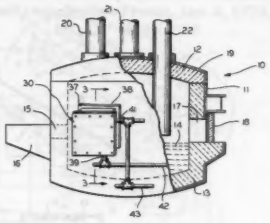
8. An electrostatic recording sheet comprises a paper sheet, electroconductive layers formed on the opposite surfaces of said paper sheet, a dielectric recording layer formed on one of said electroconductive layers, and an penetration resist layer formed between said dielectric layer and said one of electroconductive layers, said recording sheet being the product produced by the process of claim 1.

3,956,572

COOLING MEANS FOR ELECTRIC ARC FURNACES

Ronald D. Gray, Bethel Park, Pa., assignor to Pennsylvania Engineering Corporation, Pittsburgh, Pa.

Filed Mar. 11, 1975, Ser. No. 557,415
Int. Cl.² F27D 1/12
U.S. Cl. 13—32 15 Claims



10. An electric arc furnace having an outer metal shell and a refractory lining therein defining a space for molten metal, at least one electrode extending into said furnace,

means defining a chamber for coolant fluid and including a flexible diaphragm means constructed and arranged to contact said shell in opposed relation to said electrode for conducting heat from said shell,

means for effecting a seal between said flexible diaphragm means and said shell to thereby define an enclosed interspace between said flexible means and shell, and

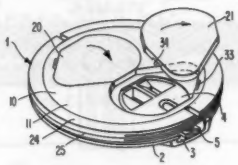
said enclosed space being evacuated so that the atmosphere may effect a pressure urging said diaphragm means against said shell.

3,956,573

FLUSH TYPE FLOOR BOX

John L. Myers, and David L. Singleton, both of Parkersburg, W. Va., assignors to Textron, Inc., Providence, R.I.

Continuation-in-part of Ser. No. 465,152, April 29, 1974. This application May 22, 1975, Ser. No. 579,944
Int. Cl.² H02G 3/12
U.S. Cl. 174—48 20 Claims



1. A floor plate assembly for use with an electrical underfloor distribution system to provide an electrical power outlet on the surface of the floor, the assembly comprising:

a receptacle ring having means for mounting an electrical receptacle;

a duplex receptacle secured to said receptacle ring;

a substantially flat floor plate mounted on said receptacle ring and formed with a generally flat top surface to be disposed flush with the surface of the floor with which the assembly is used and also formed with a pair of openings respectively providing access to said duplex receptacle, each opening including a lower section open to said receptacle and an enlarged upper section surrounding the lower section and forming a socket for a receptacle cap;

a cap gasket mounted in said sockets;

a pair of receptacle caps respectively disposed in said sockets, the caps being flush with said top surface and respectively covering said receptacles; and

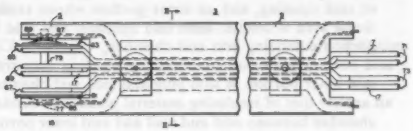
a pair of connectors respectively connecting the caps to the floor plate, each connector having means providing for its cap to be moved vertically out of its socket and then rotated over said top surface away from the socket whereby to provide access to the receptacle and said means also providing for the cap to be rotated in the opposite direction and moved downwardly into said socket whereby to cover the receptacle.

3,956,574

BUSWAY INSULATION SYSTEM

Charles L. Weimer, Beaver Falls, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 22, 1974, Ser. No. 444,941
Int. Cl.² H01B 7/02
U.S. Cl. 174—68 B 9 Claims



1. A section of bus duct comprising:

an elongated housing;

a plurality of flat bus bars disposed longitudinally within said housing, each comprising a pair of opposite wide faces and a pair of opposite narrow faces;

said bus bars being supported in said housing in a generally stacked sandwiched relationship with the wide faces thereof being in a face-to-face relationship;

a first connecting end portion formed at one end of the bus duct section;

a second connecting end portion formed at the other end of the bus duct section, said bus bars at each end of said first connecting end portion and said second connecting end portion being spaced to receive additional bus bars and insulating means in a lapped type connection;

a compact region formed intermediate said first connecting end portion and said second connecting end portion with said bus bars being sandwiched in a face-to-face relationship;

a primary insulation provided on each bus bar in said compact region;

a U-shaped secondary insulation disposed around the pair of opposite narrow faces of each of said bus bars in said compact region;

a sheet of secondary insulation disposed between the wide faces of each of said sandwiched bus bars in said compact regions; and

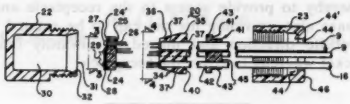
said U-shaped secondary insulation and said sheet of secondary insulation being of a non self-adhering variety so that said bus bars can slide with respect to each other without damaging the primary insulation.

3,956,575

COUPLER FOR JOINING THREE CABLES

Byron C. Sutherland, Pearland, Tex., assignor to Walker, Hall, Sears, Inc., Houston, Tex.

Filed Aug. 30, 1974, Ser. No. 502,254
Int. Cl.² H01R 5/02, 5/04, 13/58; G01V 1/16
U.S. Cl. 174—87 1 Claim



1. A coupler for mechanically and electrically interconnecting the conductors of three cables comprising in combination:

a hollow, cylindrical casing having a wall at one end, an opening at the opposite end, and a chamber between said opening and said wall, said casing having a threaded portion on the cylindrical wall thereof near its open end;

three electric cables, each cable having at least two insulated metallic conductors, each conductor having a bare end;

a resilient plug having three parallel, longitudinal bores extending therethrough, each bore snuggly enclosing one of said cables therewithin, said plug having an external portion whose cross-sectional area is larger than the area of said opening, and an inner portion whose cross-sectional area is smaller than said opening, and said inner portion extending into said chamber;

said bore ends of said conductors projecting outwardly of said inner portion of said plug and into said chamber;

an anchor disc of insulating material positioned inside said chamber between said end wall and said inner portion of said plug, said disc having a plurality of holes, each hole accepting therethrough a group of the bare ends of said conductors which project into the portion of the chamber between the inner face of the disc and said end wall;

three solder balls on said inner face, each ball embedding one group of bare ends thereby anchoring the conductors to the disc and mechanically and electrically interconnecting the conductors of the cables to form a coupling therebetween;

a hollow, cylindrical cap having a threaded end portion on the cylindrical wall thereof in threaded engagement with said threaded portion on the cylindrical wall of said casing and being open at its opposite longitudinal ends; and

said cap having means for applying pressure against said plug to seal off said opening in said casing and said bores in said plug.

3,956,576

INSULATOR FOR BATTERY CONNECTIONS

Henry E. Jensen, Lafayette Hill, and Franz M. Wagner, Lansdale, both of Pa., assignors to Eltra Corporation, Toledo, Ohio

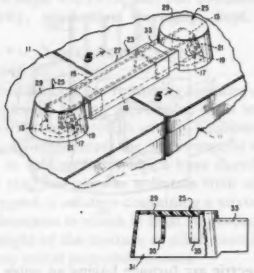
Filed Dec. 12, 1974, Ser. No. 532,135
Int. Cl.² H01R 13/44
U.S. Cl. 174—138 F 2 Claims

1. An electrical insulator, comprising:

a cover member having an inverted cup-shaped portion with an interior opening for receiving a battery post having a rectangular-shaped cross-sectional configuration and an inverted trough portion leading into the interior opening of the inverted cup-shaped portion for receiving a pair of elongated conductors connected to opposite sides of the battery post,

said cover member having a pair of spaced-apart locating fingers disposed in the interior opening of the inverted cup-shaped portion for receiving the battery post therebetween and engaging opposite side portions of the battery post located between the pair of elongated conductors for laterally positioning said cover member relative to the battery post as it is received in the interior opening of the inverted cup-shaped portion,

fastening means in the form of an inverted trough-shaped member receiving the inverted trough portion of said cover member, and



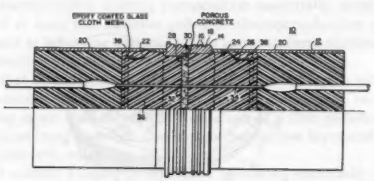
said fastening means having inwardly extending flanges formed on the lower portion thereof and being resilient for yieldingly flexing upon receiving said cover member and urging the flanges beneath the elongated conductors connected to the battery post.

3,956,577

REINFORCED SEAL STRUCTURE FOR AN ELECTRICAL PENETRATION

James F. Quirk, Pittsburgh, Pa., and David Green, Corning, N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 25, 1974, Ser. No. 509,179
Int. Cl.² G21C 13/02; H01B 17/26
U.S. Cl. 174—151 3 Claims

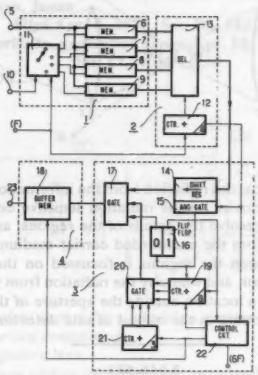


1. An electrical penetration assembly comprising a metal enclosure member, at least one metal annular seal shroud extending from and sealed to the interior surface of the metal enclosure member, which metal annular seal shroud includes a relatively rigid free end which is symmetrically spaced about the longitudinal axis of the metal enclosure member, at least one electrical conductor passing through the metal enclosure member at or parallel to the longitudinal axis of the metal enclosure member and passing through and spaced from the annular seal shroud, a compressive setting, resinous potting material substantially filling the enclosure member and providing an in situ formed compression seal along and about the conductor and along and about the free end of the annular seal shroud, the improvement wherein an annular foraminous relatively yieldable shear grading member extends from the free end of the seal shroud.

3,956,578
FACSIMILE SYSTEM FOR THE TRANSMISSION OF PICTURE

Martin de Loye, Paris; Didier Léonard, Boulogne-sur-Seine, and Claude Cardot, Gif-sur-Yvette, all of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Dec. 27, 1974, Ser. No. 536,892
Claims priority, application France, Jan. 4, 1974, 74.00270
Int. Cl.² H04N *1/38*
U.S. Cl. 178—6 **4 Claims**

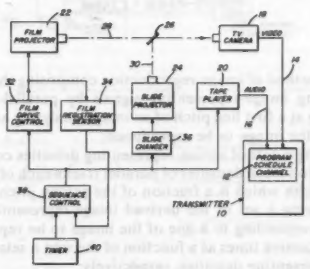


1. A facsimile transmission system for a picture constituted by black or white points arranged in rows and columns comprising at the transmission end, a compressor and a buffer memory and, at the receiving end, a decompressor and another buffer memory, the compressor (**2**) processing, simultaneously, four incident bits corresponding to four points which belong to two neighbouring rows and two neighbouring columns of the picture and in that it sends out a triplet corresponding to three of these four points, the decompressor (**26**) being adapted to restore the fourth bit as a function of at least two triplets received successively.

3,956,579
PROGRAM SCHEDULE DISPLAYING SYSTEM

Joseph A. Doumit, New Iberia, La., assignor to Dial-A-Channel, Inc.(Entire), Delcambre, La.

Filed Aug. 20, 1974, Ser. No. 499,019
Int. Cl.² H04N *5/22*
U.S. Cl. 178—6 **15 Claims**

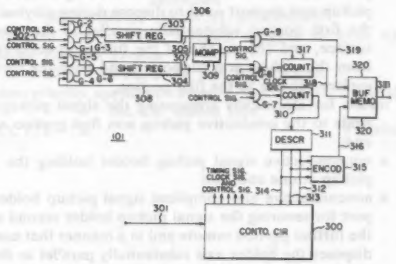


1. For use in a regional television broadcast zone wherein a television receiver may be selectively tuned to a plurality of broadcast channels over which broadcast programs are transmitted, a system for displaying program schedules, comprising a transmitter broadcasting over one of said channels, image reproducing signal means connected to the transmitter for feeding video signals thereto, at least two optical projectors, optical record means associated with said projectors for respectively storing visual program schedule and time displays, image combining means for transmitting composite images of said schedule and time displays to the image reproducing signal means from the projectors, sequence control means connected to the projectors for synchronized movement of the optical record means in opposite directions to cyclically project said composite images, and timer means connected to the sequence control means for periodically effecting a change in the composite images transmitted to the image reproducing signal means whereby timely program schedule information broadcast over said one of the channels may be viewed on said television receiver at any time.

3,956,580
SYSTEM FOR REDUCING THE TRANSMISSION TIME OF SIMILAR PORTIONS OF VISIBLE IMAGES

Noboru Murayama, Sagamihara, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 460,468, April 12, 1974, abandoned, which is a continuation of Ser. No. 212,088, Dec. 27, 1971, abandoned. This application Feb. 3, 1975, Ser. No. 546,502
Claims priority, application Japan, Dec. 30, 1970, 45-123406
Int. Cl.² H04L *3/00*
U.S. Cl. 178—6 **6 Claims**



1. Information transmission system, comprising:

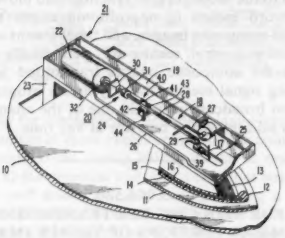
means for scanning fixed visible image or subject copy with a predetermined scanning line width to convert the image pattern of each scanning line into a binary coded bit pattern, means for comparing an old bit pattern of a scanning line with a new bit pattern of the next scanning line to determine the degree of similarity or corelation therebetween, and

means for transmitting only a first code signal representing a coincidence between said new and old bit patterns when the patterns are identical, only a second code signal representing a partial coincidence therebetween and address signals representing the positions of associated or corresponding bits which are not coincident with each other in said new and old bit patterns when said degree of similarity between the compared patterns is greater than a defined level, and only a third code signal representing a wide difference therebetween and said new bit pattern when said degree of similarity between the compared patterns is less than a defined level.

3,956,581
PICKUP ARM APPARATUS

Byron Kent Taylor, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 12, 1974, Ser. No. 522,814
Int. Cl.² A63D *15/10*; H04N *7/00*
U.S. Cl. 178—6.6 R **5 Claims**



1. In a playback system for recovering prerecorded signals by a signal pickup having a tip subject to engagement with a spirally grooved disc record rotatably mounted on a turntable surface when signal pickup/spiral groove relative speed is established, the disc record surface including a conductive coating covered with a dielectric deposit, wherein the signal pickup includes an electrode which cooperates with disc record conductive coating to form a varying capacitance as the disc record is rotated during playback, and the playback system including a supporting structure and signal processing circuitry, a pickup arm apparatus comprising:

a pickup arm support secured to the supporting structure;

a conductive pickup arm having a first portion and a further portion, one end of the first portion being secured to the pickup arm support so as to dispose during playback, (a) the first portion substantially parallel to the turntable surface, and (b) an end of the further portion remote from the pickup arm supported end near the turntable surface relative to the first portion;

means for electrically connecting the signal pickup electrode to the conductive pickup arm first portion second end;

a nonconductive signal pickup holder holding the signal pickup at one end; and

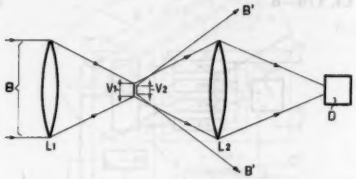
a nonconductive and compliant signal pickup holder support for securing the signal pickup holder second end to the further portion remote end in a manner that normally disposes the holder axis substantially parallel to the first portion of the pickup arm, and at an angle to the axis of the further portion at the remote end.

3,956,582
APPARATUS FOR READING A RECORD CARRIER ON WHICH INFORMATION IS RECORDED IN AT LEAST ONE TRACK

Gijsbertus Bouwhuis, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 344,866, March 26, 1973, abandoned. This application Dec. 24, 1974, Ser. No. 536,161
Claims priority, application Netherlands, Sept. 5, 1972, 7212044
Int. Cl.² H04N *5/76*
U.S. Cl. 178—6.6 R **2 Claims**

1. An apparatus for reading a record carrier of the type wherein video and audio information is recorded in the form of regions and areas of different optical properties then said regions in substantially concentric tracks, where the areas have substantially the same optical properties as the record carrier medium adjacent the tracks, the apparatus comprising a source of radiation, a radiation sensitive detector, and optical means for focussing the radiation onto a track of said record carrier as a spot of radiation having a width greater than the width of the track and smaller than the sum of the track width plus twice the distance between the track and the adjacent informationless areas between tracks, and for focussing the radiation from the tracks and from the informationless areas between tracks onto said radiation detector, the optical means including at least one lens in the path of the radiation from the tracks and having an aperture of a size

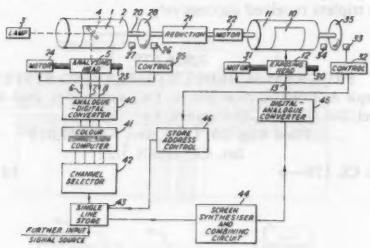


sufficient to focus the radiation from the informationless areas of the record carrier on the radiation sensitive detector and insufficient to resolve the details of the regions, and wherein the radiation from the unrecorded carrier medium and from the areas between the regions is focussed on the radiation sensitive detector, and whereby the radiation from the regions is diffracted to a location outside the aperture of the lens and results in a decrease in the output of said detector.

3,956,583
IMAGE REPRODUCTION SYSTEMS PROVIDING REPRODUCTION AT A FINER PITCH THAN INPUT SCANNING

Peter C. Pugsley, Pinner, England, assignor to Crosfield Electronics Limited, London, England

Filed Apr. 30, 1975, Ser. No. 573,334
Claims priority, application United Kingdom, May 3, 1974, 19592/74
Int. Cl.² H04N *1/06*, *1/40*
U.S. Cl. 178—6.6 R **9 Claims**



1. A method of image-reproduction comprising the steps of:

deriving image-representing signals by parallel-line scanning at a first line pitch of an image-analysing area receiving the image to be reproduced;

deriving n sets of screen-representing densities corresponding to screen densities of parallel tracks each of which has a width which is a fraction of the screen pitch;

modifying a set of the derived image-representing signals corresponding to a line of the image to be reproduced n successive times as a function of the said n sets of screen-representing densities, respectively;

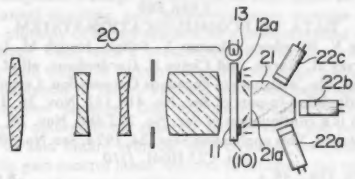
and applying each of the n sets of screen-modified image-representing signals in turn to modulate a single output element in an output scanner, the single output element providing a beam that is incident on an image-reproducing area thereof and the output scanner having means

whereby the beam scans the image-reproducing area at a pitch that is n times finer, in relation to the image-reproducing area than the pitch of the input scanner in relation to the area of the image analysed thereby.

3,956,584
OPTICAL SYSTEM FOR A TELEVISION CAMERA WITH A BIAS-LIGHT EMITTING DEVICE

Kazuo Tanaka, Tokyo; Youichi Okuno, Kanagawa; Kazuya Matsumoto, Kanagawa; Aiichiro Koyama, Kanagawa; Tomoaki Kawamura, Kanagawa, and Takehiko Kiyohara, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 4, 1975, Ser. No. 565,210
Claims priority, application Japan, Apr. 10, 1974, 49-40784
Int. Cl.² H04N *5/30*
U.S. Cl. 178—7.2 **2 Claims**

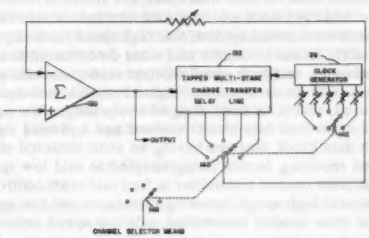


1. An optical system for a television camera with a bias-light emitting device comprising:
   a. an objective lens,
   b. an image pickup tube arranged in coaxial alignment with said objective lens, and
   c. said bias-light emitting device arranged to illuminate said image pickup tube with light from a light source, said bias-light emitting device including said light source; light-guiding means having a light entrance aperture adjacent said light source and having two boundary faces between which rays of light coming from said light source through said aperture are guided by total internal reflection, and a diffraction grating formed in the one of said two boundary faces of said light guiding means which is near to said image takeup tube, said diffraction grating splitting off a fraction of said light rays being reflected from either of said boundary faces, and directing said fraction toward said image pickup tube.

3,956,585
BUCKET-BRIGADE GHOST CANCELLER

Walter J. Butler; Charles M. Puckette, and James R. Whitten, all of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 23, 1974, Ser. No. 536,966
Int. Cl.² H04N *3/16*
U.S. Cl. 178—7.3 R **1 Claim**



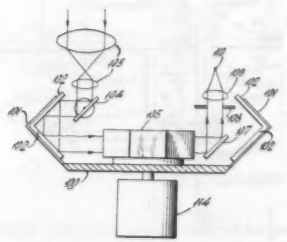
1. A ghost suppressor for inclusion in the video signal path of a television receiver of the type including channel selector means comprising:
   summing means including an electrical output and a plurality of electrical inputs; a first of said electrical inputs and said electrical output comprising the input and output respectively of said ghost suppressor and connected in series circuit relationship in said video signal path;
   multistage monolithic integrated circuit charge transfer delay line means, said delay line means including an input and a plurality of output taps, each of said output taps including a preselected number of delay line stages between it and said input;
   switch means coupled with said channel selector means for selecting one of said plurality of output taps in each position of said channel selector means;
   variable gain means connected in series circuit relationship with said plurality of output taps; said delay line, gain means and switch means connected in feedback circuit relationship with said summing means;
   variable frequency digital clock means having a first output, said first output characterized by a generally square wave signal, said first output connected to said delay line means for causing signals appearing at said input of said delay line means to be sampled, held and delayed in their propagation therethrough, the delay time being controllable by varying the frequency of said clock means, said delay time being further controllable by the selecting one of said plurality of output taps by said switch means in response to said channel selector means; said delayed signal in combination with said video signal appearing at said electrical output of said summing means being said video signal as a function of time multiplied by the transfer function

$$1/(1+\alpha e^{-\beta \omega / \gamma}).$$

3,956,586
METHOD OF OPTICAL SCANNING

Stig Leopold Ulistig, Taby, Sweden, assignor to AGA Aktiebolag, Lidingo, Sweden

Filed Oct. 30, 1974, Ser. No. 519,234
Claims priority, application Sweden, Nov. 1, 1973, 7314855
Int. Cl.² H04M *1/04*
U.S. Cl. 178—7.6 **9 Claims**

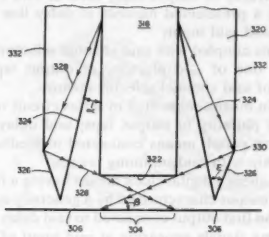


1. An optical scanning device comprising detector means for afocal scanning of an object, said detector means including a plurality of mirrored surfaces mounted in a circular path and directed inwardly for rotation about a fixed axis for angular deflection of a substantially parallel ray path, a radiation deflecting means positioned in the parallel ray path between the mirrored surfaces and the detector means and mounted for synchronous rotation with said mirrors to direct radiation onto said detector means, said detector means having an accessible substantially fixed entrance pupil on the object side thereof.

3,956,587
FACSIMILE APPARATUS

Richard L. Nelson, New York, N.Y., assignor to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 333,615, Feb. 20, 1973, abandoned. This application Nov. 5, 1973, Ser. No. 412,989
Int. Cl.[2] H04N 1/24
U.S. Cl. 178—7.6 72 Claims

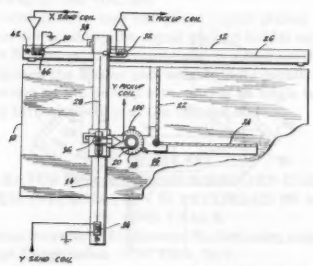


35. A facsimile transmitter comprising:
document carrying means;
reading means for detecting the light-dark variations on a document carried by said document carrying means; and
scanning means for moving said reading means relative to said document carrying means;
said reading means comprising a bundle of fiber optics including a plurality of reading fiber optics and a plurality of illuminating fiber optics, each of said reading fiber optics being substantially surrounded by illuminating fiber optics adjacent said document carrying means.

3,956,588
DIGITIZING GRAPHIC SYSTEM USING MAGNETOSTRICTIVE TRANSDUCERS

Albert L. Whetstone, Southport, and Stanley C. Phillips, Trumbull, both of Conn., assignors to Summagraphics Corporation, Fairfield, Conn.

Filed July 12, 1974, Ser. No. 487,982
Int. Cl.[2] G08C 21/00
U.S. Cl. 178—19 20 Claims

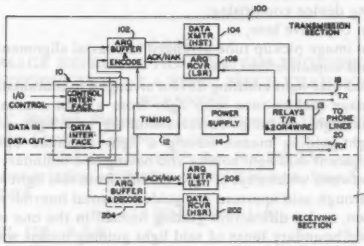


1. A digitizing graphic system comprising a digitizing area, first and second hollow longitudinal coordinate arms extendable over said area, first and second magnetostrictive elements each positioned respectively in said first and second coordinate arms, means for magnetically biasing said magnetostrictive elements, positionable means movable with respect to said first and second arms on said area, each of said magnetostrictive elements having associated therewith a sending coil fixed with respect to the respective magnetostrictive element and a receiving coil encircling a respective magnetostrictive element and slidable therealong, said first arm including a first of said receiving coils, said second arm including a second of said receiving coils, energizing means coupled to each of said sending coils for inducing magnetostrictively a strain wave longitudinally propagating along said magnetostrictive element to said respective receiving coil, digitizing means coupled to each of said sending and receiving coils for digitizing the time duration of said strain wave propagation, said positionable means coupled to each of said coordinate arms for varying the propagating distance along each of said magnetostrictive elements in accordance with the position of said positionable means, means coupling said positionable means to said first receiving coil for imparting corresponding movement of said positionable means to said first receiving coil with respect to said first magnetostrictive element, and means coupling said first arm to said second receiving coil for imparting corresponding movement of said first arm to said second receiving coil with respect to said second magnetostrictive element.

3,956,589
DATA TELECOMMUNICATION SYSTEM

Luther V. Weathers; Thomas V. Saliga; Joseph M. Looney; Harvey H. Harris, and Cletus L. Gardenhour, all of Clearwater, Fla., assignors to Paradyne Corporation, Largo, Fla.

Continuation-in-part of Ser. No. 419,142, Nov. 26, 1973, which is a continuation of Ser. No. 202,480, Nov. 26, 1971, abandoned. This application Sept. 24, 1974, Ser. No. 508,898
Int. Cl.[2] H04L 1/10
U.S. Cl. 178—58 A 8 Claims



1. A bi-directional data telecommunication system for continuous high speed error-free data communication over a half-duplex limited bandwidth transmission medium between a transmitting and receiving data telecommunications system comprising: a high speed forward data channel and a low speed reverse error control channel, said high speed forward data channel multi-plexed with said low speed reverse error control channel, said high speed data channel including a high speed data transmission section and a high speed data receiving section, said low speed reverse error control channel including a low speed reverse error control transmitter and low speed reverse error control receiver, said high speed data transmission section including means to generate an error detection code for each data block and means to transmit said error detection code and said data blocks to a receiving data telecommunications system, said high speed receiving section including means to decode said error detection code and said data blocks, said high speed receiver section including means to generate an error control signal for each said data block received, said error control signal comprising a first signal for each error-free data block received and a second signal for each data block received having an error detected said high speed receiving section being coupled to said low speed reverse error control transmitter to feed said error control signal from said high speed receiving section to said low speed reverse error control transmitter, said low speed reverse error control transmitter including means to transmit a reverse channel signal, said reverse channel signal comprising an acknowledgment signal when said first signal is received and

a negative acknowlegment when said second signal is received, said low speed reverse error control receiver including means to detect said reverse channel signals, said low speed reverse error control receiver including means to generate a data transmit signal in response to said reverse channel signals, said data transmit signal comprising a new data signal when said acknowledgment is received and a retransmit data signal when said negative acknowledgment signal is received, said high speed transmission section further including buffer means to buffer at least two transmitted data blocks until receipt of said reverse channel signal corresponding to the first of said data blocks from said low speed reverse channel transmitter from the receiving site, said high speed transmission section coupled to said low speed reverse error control receiver to receive said data transmit signals, said high speed transmitter including means to transmit new da' from said data terminal equipment when said acknowledgment message is received and retransmit buffered data when said negative acknowledgment message for continuous high speed forward data channel signaling, said acknowledgment message comprises a plurality of binary symbols of a predetermined absolute voltage value and a preselected polarity pattern and wherein said negative acknowledgment message comprises any combination of binary symbols not comprising said acknowledgment message, said low speed receiver includes circuitry to determine the absolute voltage value and polarity pattern of said binary symbols, said circuitry comprises an automatic gain control linear receiver to integrate the voltage of each of said incoming binary symbols, acceptance band comparator coupled to said linear receiver to receive said integrated voltage and compare the absolute value of said integrated voltage with a predetermined acceptance region, said acceptance band comparator including means to generate a first output signal when said integrated voltage is within said predetermined acceptance region and a second output signal when said integrated voltage exceeds said predetermined acceptance region, and binary detector and decoder means coupled to said linear receiver to receive said integrated voltage to detect and decode said incoming binary symbols, said binary detector and decoder mean being coupled to a reverse channel signal state detector, said reverse channel signal state detector including means to detect the polarity pattern of said binary symbols which comprise said reverse channel signal, said reverse channel signal state detector including means to generate a first output signal when said polarity pattern corresponds to a predetermined pattern and a second output signal when said polarity pattern varies from said predetermined polarity pattern, said logic circuitry including means to generate said new data signal in response to said first output signal from said acceptance band comparator and said first output signal from said reverse channel signal state detector and to generate said retransmit data signal in response to either said second output signal from said acceptance band comparator or said second output signal from said reverse channel signal state detector.

3,956,590

SWITCHING ARRANGEMENT FOR SWITCHING BETWEEN DIFFERENT CURRENT VALUES BY MEANS OF MECHANICAL OR ELECTRONIC SWITCHES

Ernst Schuhbauer, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Dec. 4, 1974, Ser. No. 529,497

Claims priority, application Germany, Dec. 4, 1973, 2360353

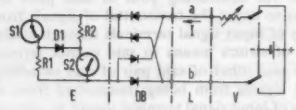
Int. Cl.² H04L *11/14*

U.S. Cl. 178—74 **4 Claims**

1. Apparatus for selectively switching between various current values in terminal equipment or remote units connected by single current lines to exchanges of data transmission systems using either mechanical or electronic switches, comprising:

a pair of current carrying wires connecting said terminal unit or remote unit to said exchange,

a predetermined number of switches connected so that the connecting paths thereof are connected in series between said wires,



a plurality of diodes polarized in the same direction, one of which forms a series connection between each adjacent pair of said switch connecting paths, and

a plurality of resistors, a junction point between a said diode and a said switch being connected to a said wire by a said resistor, like poles of said diodes being connected to a wire of like polarity.

3,956,591

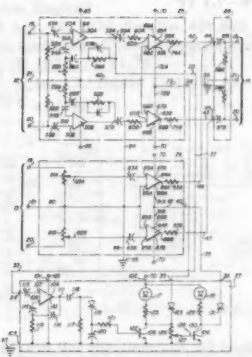
TWO-INPUT AUTOMATIC SOURCE SELECTOR FOR STEREO ENTERTAINMENT CENTER

William A. Gates, Jr., 3228 E. Delcoa Drive, Phoenix, Ariz. 85032

Filed Dec. 18, 1974, Ser. No. 533,926

Int. Cl.² G09B *5/04;* **H04R** *5/00*

U.S. Cl. 179—1 SW **5 Claims**



1. An automatic electronic source selector for use with a stereo sound system utilizing an audio signal sensor for the preferential selection of a first signal source with means for selecting a second signal source upon cessation of the signal from said first signal source, said source selector comprising:

a first group of input signal terminal means for connection to a preferential first multi-signal source,

a second group of input signal terminal means for connection to a second multi-signal source,

a group of output terminals for connection to a stereo audio signal output system,

a pair of switching means,

one of said pair of switching means connecting said first group of input signal terminal means to said output terminals and the other of said pair of switching means con-

necting the second group of input signal terminal means to said output terminals,

a sensing and control circuit for controlling the connecting of each of said pairs of switching means to said output terminals,

said sensing and control circuit comprising a sensor connected to said first group of input signal means,

means for transmitting signals from said sensing and control circuit at any time upon receipt of a given signal from said sensor for controlling both of said pairs of switching means to cause the transmittal of signals from said first group of input signal terminals through said one of said pairs of switch means to said output terminals and to cause said other of said pair of said switching means to block signals from being transmitted from said second group of input signal terminal means to said output terminals,

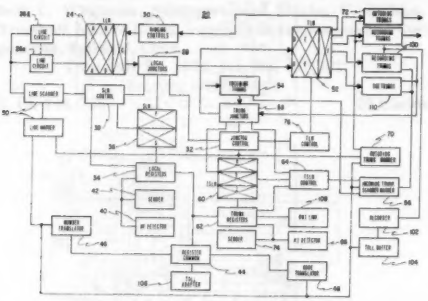
said sensing and control means upon sensing the absence of signals on at least one of the terminals of said first group of input signal terminals actuating said other of said switching means to connect said second group of input signal terminals to said output terminals,

said sensing and control circuit being provided with a time delay means for delaying the connection of said second group of input signal terminals to said output terminals upon sensing the absence of signals on said first group of input signal terminals whereby short interruptions of signals on said first group of input signal terminals will not cause a switching of said source selector.

3,956,592
AUTOMATIC TOLL TICKETING

Otto Altenburger, Rochester, and Sureshar L. Soni, Henrietta, both of N.Y., assignors to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Sept. 9, 1974, Ser. No. 504,472
Int. Cl.² H04M *15/10*
U.S. Cl. 179—7.1 TP 20 Claims



1. A method for automatically toll ticketing sent paid station-to-station connections between a calling and called party in common control telephone systems having a plurality of time shared registers accessed by a common register control for the translation of information stored therein comprising the steps of:

a. storing a calling number representation in a selected register;

b. storing a called number representation in said selected register;

c. storing a toll indicator in said selected register as a result of the translation of a dialed access code;

d. scanning said common registers for a toll indicator during their respective common register control access times until a said indicator is found;

e. transferring the stored representations and indicator from said register to a toll buffer circuit when said indicator is found in said register;

f. seizing a recording trunk in response to the storage of a toll indicator in a register for connecting said calling and called parties;

g. writing a seizure signal into a memory call upon seizure of said recording trunk;

h. transferring the information stored in said toll buffer circuit into said memory cell after said seizure signal is written;

i. writing an answer into said memory cell after the connection is completed through said recording trunk and said called party goes off hook;

j. writing the elapsed time of the connection in said memory cell while the seizure and answer signal are stored in said memory cell;

k. erasing the seizure signal from said memory cell when said calling party goes on hook;

l. erasing the answer signal from said memory cell when said called party goes on hook;

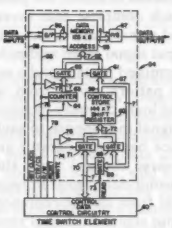
m. writing a disconnect signal into said memory cell when said seizure signal is erased and writing said disconnect signal into said memory cell when said answer signal is erased, and

n. transferring the information stored in said memory cell onto an output medium after said disconnect signal is written.

3,956,593
TIME SPACE TIME (TST) SWITCH WITH COMBINED AND DISTRIBUTED STATE STORE AND CONTROL STORE

Arthur A. Collins; John C. Bellamy, II, both of Dallas, and Richard L. Christensen, Richardson, all of Tex., assignors to Artura A. Collins, Inc., Dallas, Tex.

Filed Oct. 15, 1974, Ser. No. 514,828
Int. Cl.² H04Q *11/04*; H04J *3/00*
U.S. Cl. 179—15 AQ 33 Claims

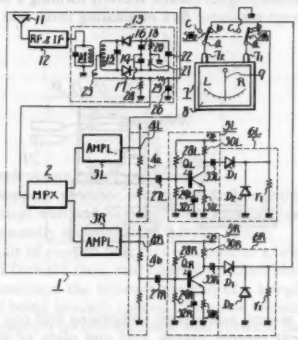


1. In a switch for interconnecting between data incoming and outgoing digital time division multiplex communication lines: time division digital signal switch element means including, multi-word end around shift register means having an input end and an output end; through digitial data transmitting means; multi-path control signal bus means interconnecting the output end of said multi-word end around shift register means and said through digital data transmitting means; said multi-word end around shift register means including recirculation loop bus means with first gate means through to the input end of the shift register; control data source means; control data bus means with second gate means interconnecting said control data source means and said input end of the shift register; activating control means for said first and second gate means; and step control signal input means to said multi-word end around shift register means.

3,956,594
INDICATING CIRCUIT FOR AN FM STEREOPHONIC SIGNAL RECEIVER

Seiji Hirata, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 25, 1974, Ser. No. 526,817
Claims priority, application Japan, Nov. 29, 1973, 48-137615
Int. Cl.² H04H 5/00
U.S. Cl. 179—15 BT **5 Claims**



1. An indicating circuit for an FM stereophonic signal receiver for providing dual indications of tuning and channel balance, comprising:

tuning detecting means for providing a first signal having magnitude and polarity representing the relative tuning condition of said receiver with respect to a received FM signal;

first channel level detecting means for providing a second signal having magnitude representing the level of an audio signal transmitted in a first signal channel of said signal receiver;

second channel level detecting means for providing a third signal having magnitude representing the level of an audio signal transmitted in a second signal channel of said signal receiver;

a null meter having a movable pointer that is displaced proportional to the magnitude and in a direction proportional to the polarity of a signal applied thereto; and

switch means for selectively supplying said first signal and said second and third signals to said null meter; whereby the relative tuning condition of said receiver is indicated, and the level difference between the audio signals transmitted in said first and second channels is indicated.

3,956,595
CIRCUITRY FOR PROVIDING EXECUTIVE RINGBACK IN A PBX SYSTEM

Edward Walter Sobanski, Boulder, Colo., assignor to Western Electric Company, New York, N.Y.

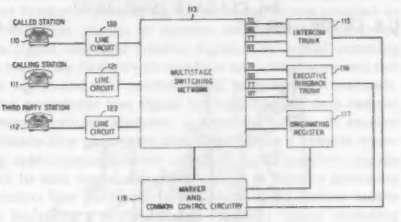
Filed Oct. 3, 1974, Ser. No. 511,753
Int. Cl.³ H04M 3/48
U.S. Cl. 179—18 BG **16 Claims**

1. In a telephone switching system having a plurality of line circuits terminated in station sets, said line circuits being interconnectable to a plurality of trunk circuits through crosspoint connections in a multistage switching network, the invention comprising executive ringback circuitry for completing a connection between a calling station and a called station at the conclusion of a connection between said called station and a third party station, said executive ringback circuitry including

means for determining the class of service provided to said calling station,

means for detecting a busy condition of said called station,

means, activated by said class of service determining means and said busy condition detecting means, for seizing said executive ringback circuitry provided said calling station has a class of service permitting executive ringback,



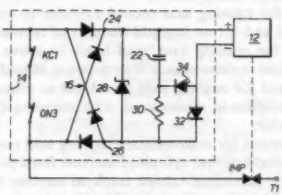
means for enabling said executive ringback circuitry in response to a switchhook flash from said calling station, and

means, responsive to said switchhook flash enabling signal from said calling station, for holding said seizure of said executive ringback circuitry to maintain said crosspoint connections through said multistage switching network until said busy called station goes idle.

3,956,596
CIRCUIT ARRANGEMENTS IN TELEPHONE APPARATUS

David Charles Antony Connolly, Shildon; Per Jorgen Hovland, and Robert Andrew Stevenson, both of Newton Aycliffe, all of England, assignors to The General Electric Company Limited, London, England

Filed Apr. 10, 1974, Ser. No. 459,860
Claims priority, application United Kingdom, Apr. 10, 1973, 17183/73; June 22, 1973, 29781/73
Int. Cl.² H04M 1/44
U.S. Cl. 179—90 K **2 Claims**



1. Telephone apparatus, such as a subscriber's set, including

A. an electronic circuit for generating dialling impulses,

B. a circuit arrangement for energizing said electronic circuit comprising

i. a capacitor,

ii. bridge rectifier means,

iii. current limiting means,

iv. switch means for connecting said rectifier means in series with the line loop and for connecting said capacitor to be charged by way of said current limiting means by at least a portion of line loop current passing through said rectifier means, during the time that said electronic circuit requires current for its operation, and for preventing line loop current passing through said rectifier means when dialling has ceased, and

v. further rectifier means to derive current for said electronic circuit means from either side of said current limiting means, whereby said electronic circuit means is ener-

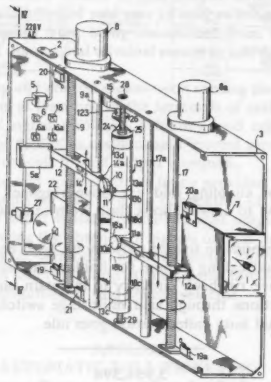
gized initially before said capacitor is sufficiently charged.

3,956,597

SPEAKING TIME KEEPER

Aldo Carrarini, Via Santa Viola, 13, Tivoli, Italy

Filed Mar. 5, 1974, Ser. No. 448,392
Claims priority, application Italy, Mar. 6, 1973, 48635/73
Int. Cl.² G11B *19/00, 23/30*
U.S. Cl. 179—100.1 C **6 Claims**



1. Apparatus for announcing messages representing measurements of physical quantities, comprising in combination:

a record cylinder having a series of circumferentially extending record tracks thereon disposed in longitudinally spaced relation along said cylinder, each record track being circular such that the end thereof merges with its beginning;

a read head mounted adjacent said record cylinder for movement into and out of pick-up relation with respect to said record cylinder and for movement along the length of said cylinder;

means for causing said record cylinder to rotate on command and for an integral number of revolutions;

means for causing said read head to move into pick-up position in consonance with rotation of said record cylinder and for causing said read head to move out of pick-up position in consonance with stopping of said record cylinder;

timer means for continuously moving said read head along the length of said cylinder from one fixed position aligned with a particular record track to another fixed position aligned with another record track only when said pick-up head is out of pick-up position; and

means for automatically resetting said read head in its starting position at the end of its longitudinal movement along said record cylinder.

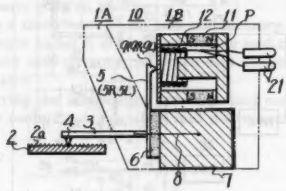
3,956,598

MOVING COIL PICKUP CARTRIDGE WITH DIAPHRAGM COUPLING

Hirotake Kawakami, Tokyo, and Shokichi Tatara, Yokahama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 17, 1974, Ser. No. 533,663
Claims priority, application Japan, Dec. 22, 1973, 49-1370
Int. Cl.² H04R *9/16*
U.S. Cl. 179—100.41 K **4 Claims**

1. A pickup cartridge comprising signal conversion means and replaceable signal transmission means, the signal transmission means including a cantilever having a stylus at one end thereof adapted to scan the sound grooves of a record disc and to produce mechanical vibrations corresponding to sound groove signals; and an arm mechanically coupled at one end thereof to said cantilever at a position remote from said stylus, said arm being bidirectionally displaced in direct relation to said mechanical vibrations of said cantilever; and the signal conversion means including a first magnetic yoke having an end plate and a projection therefrom so as to be of substantially T-shaped cross-section; permanent magnet means having spaced apart north and south poles, one of said poles being in contact with said end plate, said permanent magnet means and said projection defining a gap; a second magnetic yoke having one end thereof in contact with the other of said poles of said permanent magnet means, thereby forming a magnetic circuit for direct magnetic flux originating from said permanent magnet means, said circuit comprising said one pole of said permanent magnet means, said end plate of said first magnetic yoke, said projection of said first magnetic yoke, said gap, said second magnetic yoke and said other pole of said permanent magnet means; a diaphragm coupled to the other end of said second magnetic yoke and having a surface thereof in contact with the other end of said arm such that said diaphragm is displaced in response to the bidirectional displacement of said arm; and a coil coupled to the other surface of said diaphragm, the entirety of said coil being disposed in the magnetic field and having its longitudinal axis substantially perpendicular to said magnetic flux in said gap, whereby a voltage is induced in said coil in response to the movement thereof caused by the displacement of said diaphragm.

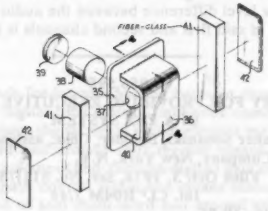


3,956,599

DOME LOUDSPEAKER

Frank H. McIntosh, 3720 Pheasant Lane, Endwell, N.Y. 13760

Filed Jan. 17, 1975, Ser. No. 542,030
Int. Cl.² H04R *9/04, 9/06*
U.S. Cl. 179—115.5 R **9 Claims**

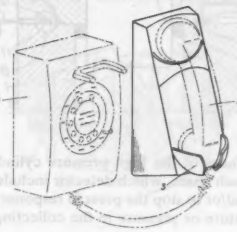


1. A dome loudspeaker, including a permanent magnet, a pole plate, a U-shaped keeper having arms welded to said pole plate and open sides formed by said arms, closure plates for said open sides, a dome, a voice coil secured to said dome, said voice coil extending between said permanent magnet and said pole plate, and means securing said dome at its edges to said pole plate.

3,956,600
WALL TELEPHONE CADDY

Jimmie A. Ray, P.O. Box 922, Sebastopol, Calif. 94572

Filed Sept. 3, 1974, Ser. No. 502,376
Int. Cl.² H04M 1/06
U.S. Cl. 179—146 R 2 Claims



1. A telephone caddy comprising:

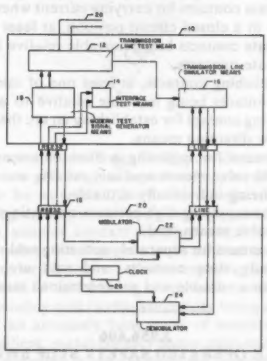
a. a support member having means mounting same on a vertical wall and having a substantially planar front face rearwardly inclined from bottom to top;

b. a pair of cupped brackets mounted to a lower portion of said forward face, said cupped brackets being contoured to embrace the microphone end of a telephone handset and being laterally spaced to provide clearance for a line connected to said headset; said forward face having an arcuate upwardly concave shoulder on an upper portion thereof spaced from said cupped bracket to define a support for the speaker end of a telephone handset, whereby a handset placed on the inclined face of said caddy will be supported at both the microphone and speaker ends thereof.

3,956,601
TELECOMMUNICATIONS ANALYZER

Harvey H. Harris, Clearwater, Fla.; Thomas V. Saliga, San Diego, Calif., and Luke G. Smithwick, Clearwater, Fla., assignors to Paradyne Corporation, Largo, Fla.

Filed Oct. 17, 1974, Ser. No. 516,138
Int. Cl.² H04B 3/46
U.S. Cl. 179—175.3 R 40 Claims

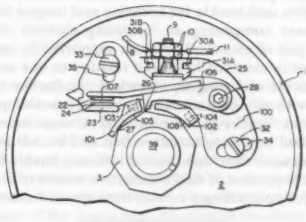


1. A telecommunications analyzer for monitoring transmission line performance between a local and remote telecommunications analyzer: said telecommunications anaylzer comprising a transmitter means including a test signal generator means including circuitry to generate a predetermined test pattern signal corresponding to each of a plurality of transmission line parameters for transmission to a remote telecommunications analyzer, a control means including means to generate a plurality of command signals corresponding to each of said plurality of transmission line parameters to be monitored, said transmitter means coupled to said control means to receive said command signal to control generation of said predetermined test pattern signals, said transmitter means further including control signal generator means including circuity to generate a control signal corresponding to each of said plurality of transmission line parameters, said telecommunications analyzer further including signal summing means coupled to said transmitter means to receive said predetermined test pattern signal and said control signal, said signal summing means including circuitry to combine said predetermined test pattern signal and said control signal to generate a transmission line parameter test signal for transmission to a remote telecommunications analyzer; a receiver means to receive transmission line parameter test signals from a remote transmitting telecommunications anlayzer, said receiver means coupled to said signal summing means to receive incoming transmission line parameter test signals, said receiver means further including a control signal recovery means including circuitry to recover said control signals, said control signal recovery means coupled to said control means, said control means including circuitry to generate a command signal corresponding to each said transmission line parameter test signals, said receiver means further including a parameter selector means coupled to said control means to receive said command signals to selectively control the transmission of said predetermined test pattern signal to said parameter test means, said parameter test means including circuitry to recover each said predetermined test pattern signals and generate an output signal in response thereto, and a display means coupled to said parameter test means to receive said output signal, said display means including means to display the transmission line performance measured between said remote telecommunications analyzer and said local telecommunications analyzer with respect to time.

3,956,602
PRE-GAPPED BREAKER POINT ASSEMBLY

William E. Clark, P.O. Box 702, Pinedale, Wyo. 82941

Filed Feb. 12, 1975, Ser. No. 549,419
Int. Cl.² H01H 19/62
U.S. Cl. 200—31 A 2 Claims



1. A pre-gapped breaker point assembly for a distributor of an ignition system of an internal combustion engine, the assembly being adapted to be adjustably mounted on a moveable mounting plate in said distributor, the breaker point assembly being secured in proximity to a cam of said distributor, the assembly having a cam follower resiliently urged into contact with said cam and having an arm attached thereto, the arm terminating in a first breaker contact point, the cam follower being operable between said cam and said moveable arm so as to intermittently separate said first contact point from second contact point coincident with a high point on said cam, the first contact point being electrically isolated from the breaker point framework and the second contact point being in electrical contact with said breaker point framework; the improvement comprising:

means for independently mounting at least two separately mountable spacing blocks on said breaker point assembly, each of said mounting means comprising a flange on the breaker point assembly and upon which flanges said spacing blocks are removeably mounted, said spacing blocks comprising a first and a second spacing block, each spacing block comprising at least one abutment surface adapted to be placed in juxtaposition against at least one high point on said cam to thereby selectively achieve a suitable predetermined position of said breaker point assembly with respect to the breaker plate and in coincident with the cam follower at a third high point on said cam and thereby establish a predetermined maximum separation of said first and said second contact points; and

a substitute spacing block for the first spacing block and mountable upon the flange to change the relative position of the breaker point assembly with respect to the cam without affecting the position of the second spacing block on the breaker point assembly.

3,956,603

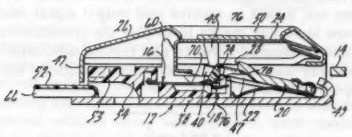
SEAT BELT BUCKLE SWITCH HAVING WIRE BRIDGING CONTACT

Robert C. Fisher, 580 E. Long Lake Road, Bloomfield Hills, Mich. 48013

Continuation of Ser. No. 385,332, Aug. 3, 1973, abandoned. This application Aug. 14, 1974, Ser. No. 497,224

Int. Cl.² H01H *3/20, 1/20*; A44B *11/25*

U.S. Cl. 200—61.58 B **8 Claims**



4. In a passenger restraint system for a vehicle comprising a belt having ends adapted to be secured together about the occupant of a vehicle, a buckle on one end of said belt having an open end, a tongue on the other end of the belt insertable through the open end of said buckle, and releasable latching means within said buckle for securing said tongue therein, the improvement comprising an insulating element within said buckle, a pair of electrical contacts supported by said insulating element in electrically spaced relation to one another and to said buckle and tongue, electrical conductive means engageable with said contacts and having a movable portion for making and breaking an electrical circuit between said contacts, and insulating means within said buckle movable by said tongue upon insertion thereof into said buckle for moving the movable portion of said conductive means relative to said contacts for controlling a circuit through said contacts.

3,956,604

HIGH PRESSURE APPARATUS HAVING MEANS FOR DETECTING A LEAKAGE

Hans Larker, and Jan Nilsson, both of Robertsfors, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

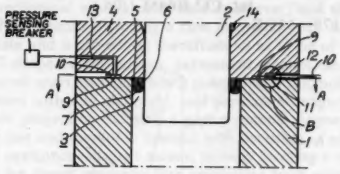
Filed June 19, 1974, Ser. No. 480,931

Claims priority, application Sweden, June 26, 1973, 7308927

Int. Cl.² H01H *35/00*

U.S. Cl. 200—61.08 **2 Claims**

1. In a hydrostatic extrusion press having a high pressure cylinder and a seal holder engaging one end of the high pressure cylinder and a seal engaging the inner surface of the high pressure cylinder and the seal holder, means spaced away from and outside the seal forming an annular collecting space between adjacent surfaces of the seal holder and the high pressure cylinder, and a detector for sensing a temperature or pressure increase caused by pressure medium leaking between



the engaging surfaces of the high pressure cylinder and the seal holder into such space, which detector includes means to release a signal and/or to stop the press in response to a predetermined temperature or pressure in the collecting space.

3,956,605

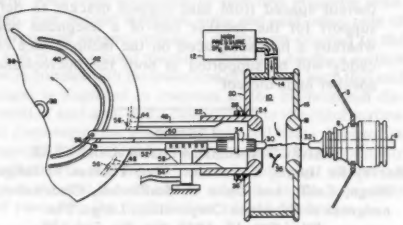
FLUID BLAST CIRCUIT INTERRUPTER WITH A COMPACT NOZZLE STRUCTURE AND VERSATILE OPERATING MECHANISM

Robert M. Roidt, and Bruce W. Swanson, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 20, 1974, Ser. No. 471,737

Int. Cl.² H01H *33/42*

U.S. Cl. 200—148 B **10 Claims**



1. A fluid-blast circuit interrupter comprising:

a. steady-state contacts for carrying current when said interrupter is in a closed circuit position, at least one of said steady-state contacts being movable relative to the other steady-state contacts,

b. arc-establishing contacts, at least one of said arc-establishing contacts being movable relative to another arc-establishing contact for establishing an arc therebetween,

c. fluid flow directing means,

d. valve means for initiating a blast of arc-extinguishing fluid, said valve means and said moving arc-establishing contact being individually actuable,

e. means for supplying high pressure arc-extinguishing fluid to said valve means, and

f. common means for separately actuating said valve means, said steady state contacts, and said arc establishing contact in a variable and predetermined manner.

3,956,606

CABLE OPERATED SAFETY STOP SWITCH

Robert C. Reiter, Aurora, Ill., assignor to Material Control, Inc., Aurora, Ill.

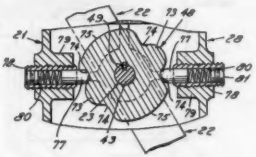
Filed Apr. 25, 1974, Ser. No. 463,883

Int. Cl.² H01H *17/08*

U.S. Cl. 200—161 **21 Claims**

1. A switch unit to control at least in part the operation of a powered system, comprising a shaft rotatively mounted to pivot between operated and release positions and axially shift-

able as an incident to its pivoting between said positions, operating arm means connected to said shaft to selectively so pivot the same, at least one externally actuated cable operatively connected to said arm means to actuate the latter in pivoting the shaft, and means releasably locking said shaft at one of said operated and release positions while permitting a rotative pivoting of the shaft from said one position to said



other position, said last named means comprising a locking member rotatable and axially shiftable with said shaft, and a fixed keeper member engageable with said locking member in one of its said pivoted positions to so lock the latter in that position, said locking and keeper members being disengaged upon an axial shift of said shaft to free the latter to pivot to its said other position.

3,956,607

ELECTRIC CONTACT DEVICE

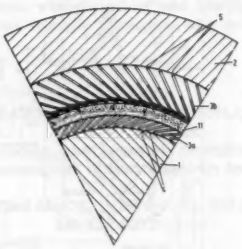
Marius Frederik Fierst Van Wijnandsbergen, Breukelen, Netherlands, assignor to COQ B.V., Utrecht, Netherlands

Filed Apr. 18, 1974, Ser. No. 462,095

Claims priority, application Netherlands, May 3, 1973, 7306193

Int. Cl.² H01H 1/50; H01R 11/22

U.S. Cl. 200—260 **13 Claims**



1. An electric contact device being provided with two cooperating contacts which are adapted to be placed into contact with and to be separated from one another, one of said contacts being a contact pin and the other one thereof being a composite annular contact member which surrounds the contact pin, when the device is in its contact making condition, said annular contact member comprising a metal holder, a cavity formed in said holder, a circumferential wall of the holder surrounding said cavity, said cavity being coaxial to the contact pin, an annularly bent stack of interlocking, equal, V-folded, resilient, metal contact plates, said stack of contact plates being mounted in the cavity of the holder, free contact edges formed on said contact plates, said contact edges extending parallel to the folds of the V-folded contact plates and being resiliently forced against the contact pin and said circumferential wall of the holder, respectively, when the contact device is in its contact making condition, the dimension of the part of each contact plate extending inwards from the fold of the plate at right angles with said fold being smaller than the corresponding dimension of the part of the plate extending outwards from said fold, a slot formed in the narrower part of each contact plate and extending from the contact edge of said part to the fold of the plate and a stabilizing ring extending through the slots of all contact plates to hold the latter in place in the cavity of the holder.

3,956,608

ENERGY SEAL FOR A MICROWAVE OVEN

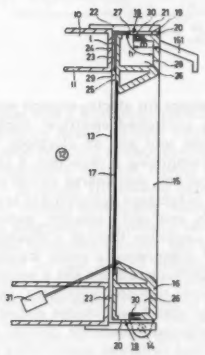
Bengt Uno Imberg, and George Gustav Orke, both of Norrkoping, Sweden, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 10, 1972, Ser. No. 295,800

Claims priority, application Sweden, Oct. 19, 1971, 13212/71

Int. Cl.² H05B 9/06

U.S. Cl. 219—10.55 D **14 Claims**

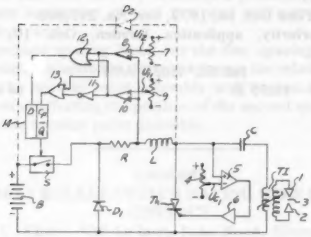


1. A microwave oven comprising an enclosure having an inner wall which defines an oven cavity and an access opening, a door for closing said opening, means for feeding microwave energy into the cavity, said enclosure being provided at the area of the opening with a projecting frame having an inner surface which encloses a space which can accommodate the door in the closed position so that a gap remains between the inner surface of the frame and the edge of the door, said gap constituting a communication path between the oven cavity and the outside environment, a quarter-wave choke arranged along a part of said gap with its entrance opening arranged along the gap so as to prevent energy from leaking away from the oven cavity via the gap, a door-operated safety switch operatively coupled to the door for interrupting the supply of microwave energy to the oven cavity upon a given displacement of the door when the door is opened from the closed position, the distance, when the door is closed, between said entrance opening of the quarter-wave choke and the outer edge of said frame being larger than the distance through which the edge of the door must be displaced from the closed position so as to actuate the safety switch, the gap communicating with the oven cavity via a slot formed between, on the one side, a surface of the enclosure which adjoins the said inner surface of the frame and, on the other side, a surface on the inside of the door which adjoins the edge of the door.

3,956,609
PULSE GENERATOR FOR ELECTRO-EROSION MACHINING APPARATUS

Georges-André Marendaz, Meyrin, Geneva, Switzerland, assignor to Ateliers des Charmilles S.A., Geneva, Switzerland

Filed Aug. 19, 1974, Ser. No. 498,655
Claims priority, application Switzerland, Aug. 31, 1973, 12505/73
Int. Cl.² B23K 9/16
U.S. Cl. 219—69 P 6 Claims



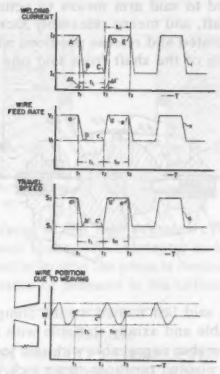
1. A pulse generator for electro-erosion machining apparatus for supplying controlled electrical discharge pulses between an electrode tool and an electrode workpiece, said pulse generator comprising a capacitor, a charge circuit for charging said capacitor, said charge circuit comprising a DC power supply, an inductance connected in series between said DC power supply and said capacitor, switching means for discharging said capacitor through a discharge circuit, said discharge circuit comprising a pulse transformer having a primary in said discharge circuit and a secondary connected across said electrode tool and workpiece, and means for adjusting the voltage across said charge circuit for maintaining between predetermined values the current flowing through said inductance, said switching means being closed when the voltage across said capacitor reaches a predetermined level.

3,956,610
METHOD FOR WELDING IRON STEEL AND NONFERROUS ALLOY

Yoshio Kanbe, Narashino; Takao Ishii, Funabashi; Kazuo Nagatomo, Narashino; Hirohisa Fujiyama, Tokyo, and Tsuyoshi Takino, Yachiyo, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 188,211, Oct. 12, 1971, abandoned. This application July 16, 1973, Ser. No. 379,225
Claims priority, application Japan, Oct. 13, 1970, 45-89309; Oct. 24, 1970, 45-93186; Nov. 17, 1970, 45-100748; Dec. 1, 1970, 45-105472; Mar. 24, 1971, 46-16496
Int. Cl.² B23K 9/12
U.S. Cl. 219—137 PS 20 Claims

1. The method of welding metals which comprises striking an arc with a metal electrode, supplying a first value of current to the arc through the electrode, maintaining the arc while changing the current so as to apply a second value to the arc, maintaining the arc while changing the current back and forth between the first and second values every 0.3 to 3 seconds, the first value being just sufficient to maintain the arc and substantially avoid transfer of metal beyond a trace through the arc, the second value being substantially larger than the first value and sufficient for producing a spray transfer of metal, and feeding the metal electrode into the arc so as to permit formation of the respective arcs, moving the arc and the metal electrode generally along a path and weaving the arc and electrode transverse to the path, changing the speed of movement of the electrode in the path synchronously with the changes in current and initiating and halting the weaving of

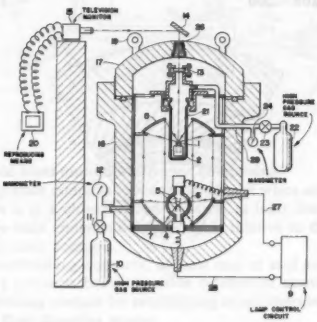


the welding electrode in synchronism with the periodic change of the welding current.

3,956,611
HIGH PRESSURE RADIANT ENERGY IMAGE FURNACE

Yoshihiko Nakamura, Kawasaki, Japan, assignor to Ushio Electric Inc., Tokyo, Japan

Filed Dec. 17, 1973, Ser. No. 425,144
Int. Cl.² H05B 1/00
U.S. Cl. 219—349 2 Claims

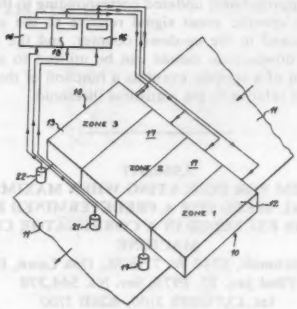


1. A heating apparatus comprising a heat source including the arc of a Xenon short-arc lamp, an optical system for concentrating the radiant energy from said heat source on a sample to be heated, a thin wall sample vessel transparent to the radiant energy from said heat source and enclosing said sample air-tightly therein, a high pressure vessel resistible to more than 10 atmospheres and enclosing said heat source, said optical system, said sample and said sample vessel therein, a power supply cable passing air-tightly through the wall of said high pressure vessel for said heat source, a first high pressure gas source communicating with said high pressure vessel, and a second high pressure gas source communicating with said sample vessel, the sample in said sample vessel being subjected to a pressure of more than 10 atmospheres and the gas pressures in said high pressure vessel and said sample vessel being substantially the same, whereby pressure stresses on the sample vessel created by any difference in gas pressure inside and outside of the sample vessel are eliminated and the sample is safely heated.

3,956,612
RADIANT HEATING MODULAR UNIT

Jules Ballard, Teaneck, and Leonard D. Gigantino, Maplewood, both of N.J., assignors to Irex Corporation, Riverdale, N.J.

Filed Oct. 4, 1974, Ser. No. 512,269
Int. Cl.² H05B 1/02, 3/02; H01C 1/01
U.S. Cl. 219—358 **9 Claims**

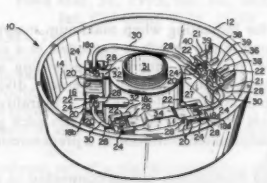


1. A radiant heating module for processing web material comprising a plurality of radiant heating elements, a plurality of laterally abutting frame units for carrying said radiant heating elements, means for joining said frame units into a single heating module having an end unit at each end of the module, each of said frame units including a front wall and a back wall with the sides of the units being open, means on said front and back walls for supporting said heating elements, an outer side member for closing the outer side of each of said end frame units, and means including connectors of equal length for interconnecting said heating elements within each of said frame units and from each of said abutting frame units to its contiguous unit, whereby all of said heating elements are equally spaced laterally throughout the entire module of frame units.

3,956,613
BASE ELEMENT FOR AN IMMERSIBLE ELECTRIC COFFEE MAKER

William C. Dobson, and James M. Straughn, both of West Bend, Wis., assignors to Dart Industries Inc., Los Angeles, Calif.

Filed Mar. 5, 1975, Ser. No. 555,471
Int. Cl.² F27D 11/02
U.S. Cl. 219—436 **4 Claims**



1. In an electrical cooking utensil base structure having a heating unit, thermostat and appropriate circuitry assembled therein to provide controlled heat for cooking, wherein the improvement comprises:

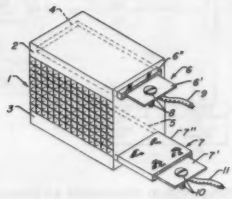
a base portion having a plarality of hollow pedestals extending upwardly from the bottom interior surface thereof, said pedestals forming receptacles for a sealing material and including mounting means for positioning electrical part connections within said receptacles, said base portion, pedestals and sealing material being constructed of dielectric material; and,

sidewalls extending upwardly from the periphery of said bottom interior surface of said base portion.

3,956,614
ELECTRIC CURRENT DISTRIBUTION MEANS FOR A CERAMIC TYPE OF ELECTRICAL RESISTANCE HEATER ELEMENT

George L. Hervert, Woodstock, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Apr. 21, 1975, Ser. No. 570,323
Int. Cl.² H05B 3/08
U.S. Cl. 219—541 **8 Claims**



1. In combination with a monolithic refractory ceramic type of electrical resistance heater element where conductivity is imparted to the heat radiating surface thereof by the compositing of a semiconductive material, having a conductivity of from about 10^{-6} to about 10^{2} inverse ohm-centimeters the improved electric current distributing means for an element, which comprises, elongated slot openings along spaced opposing portions of said refractory element, and slidably insertable electrode members for said spaced openings to provide for electrical resistance heating across the width of the element, with each such electrode member having an outer covering of metal felt over a metal core member which is, in turn, provided with a terminal means for a current supplying lead wire, and with the external size and shape of the metal felt covering being such as to effect a slip fit into a spaced opening when there is no current flow, whereby upon electric current flow for heat producing operations there is an expansion of each of the electrode members to result in tight and efficient electrical contacts with the conductive surfaces of the element.

3,956,615
TRANSACTION EXECUTION SYSTEM WITH SECURE DATA STORAGE AND COMMUNICATIONS

Thomas G. Anderson, Los Altos; William A. Boothroyd, and Richard C. Frey, both of San Jose, all of Calif., assignors to IBM Corporation, Armonk, N.Y.

Filed June 25, 1974, Ser. No. 483,084
Int. Cl.² H04Q 9/00; G06K 7/00
U.S. Cl. 235—61.7 B **28 Claims**

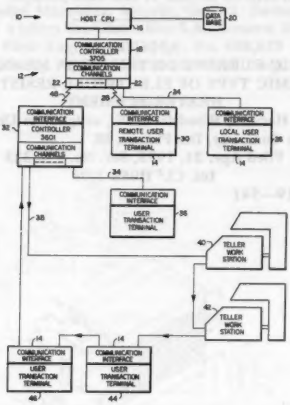
1. A transaction terminal which is connectable to a host and which is dependent upon a host for approval and recordation of transactions indicated by a user, the transaction terminal comprising:

a data input device for entering a user determined block of identification information;

an encoder connected to encode at least a portion of the block of identification information to produce a first encrypted block of identification information indicative of at least a portion of the identification block of information;

an encoder connected to encode at least a portion of the first encrypted block of identification information to produce a second encrypted block of identification infor-

mation indicative of at least a portion of the identification block of information; and



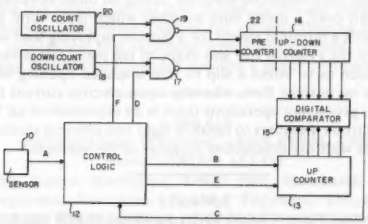
a transmitting system connected to transmit at least a portion of the second encrypted block of identification information to a host.

3,956,616

METHOD AND APPARATUS FOR GENERATING A STATISTICAL BASIS

Robert G. Knollenberg, 632 Peakview, Boulder Heights, Colo. 80302

Filed May 6, 1974, Ser. No. 466,934
Int. Cl.² H03K *21/06*
U.S. Cl. 235—92 CC **13 Claims**



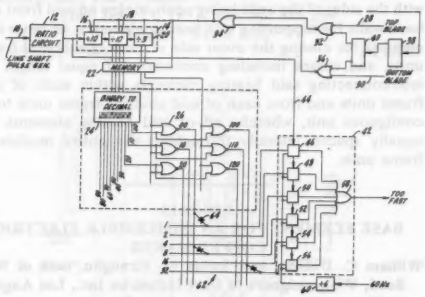
1. A system for generating a currently updated statistical datum threshold, comprising: an up-down counter, an up-counter, a digital comparator connected to both the up-down counter and the up-counter and responsive to an equivalency of count in the up-counter and the up-down counter, means for generating a digital input signal at least proportional to a signal measuring the magnitude of a parameter of an event, the digital input signal being applied to the up-counter, latch means to maintain the digital input signal at least until response by the digital comparator indicating equivalency of count between the up-counter and the up-down counter, down-count means providing a signal initiated by completion of the signal measuring the event parameter magnitude prior to response by the digital comparator and terminated by response by the digital comparator, the down-count means signal being ultimately applied to the down-count input of the up-down counter as a down-count frequency, up-count means providing a signal initiated by response from the digital comparator prior to completion of the signal measuring the event parameter magnitude and terminated by completion of the signal measuring the event parameter magnitude, the up-count means signal being ultimately applied to the up-count input of the up-down counter as an up-count frequency, and means to reset the up-counter upon both termination of the signal measuring the magnitude of a parameter and response from the digital comparator, whereby the magnitude of the signal measuring the event parameter is compared to a statistical signal magnitude threshold of previous signals stored as the count in the up-down counter, the count of the up-down counter is appropriately updated corresponding to the magnitude of the specific event signal relative to the statistical threshold stored in the up-down counter, and the up-count means and down-count means can be utilized to accept or reject datum of a specific event as a function of the specific event datum relative to the statistical threshold.

3,956,617

SYSTEM FOR INDICATING WHEN MAXIMUM MATERIAL SPEED FOR A PREDETERMINED BOARD LENGTH IS EXCEEDED IN A CORRUGATOR CUT-OFF MACHINE

Robert W. Schmidt, 5744 W. 77th St., Oak Lawn, Ill. 60459

Filed Jan. 27, 1975, Ser. No. 544,370
Int. Cl.² G05B *5/00*; B26D *5/00*
U.S. Cl. 235—151.1 **10 Claims**



1. A system for indicating when maximum material speed for predetermined board length is exceeded in a corrugator cut-off machine, including means for providing an output pulse for each increment of material movement, divide circuit means connected to said pulse means, a plurality of gates connected to said divide circuit means, with each gate being placed in a predetermined condition at a predetermined range of board length,

material speed comparison means connected to said pulse means, circuit means connected between said gates and said comparison means for providing a signal representative of maximum material speed for a predetermined range of material movement said comparison means including means for comparing said signal representative of maximum material speed with the output of said pulse means, over a predetermined interval, and providing an output signal when the number of pulses from said pulse means during said interval exceeds the signal representative of maximum material speed.

3,956,618

MECHANICAL-ELECTRICAL TRANSDUCER

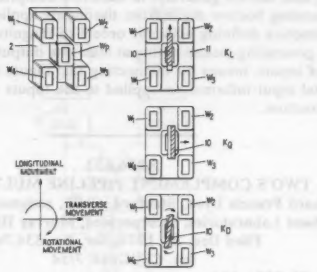
Karl Georg Götz, Tubingen, Germany, assignor to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V., Gottingen, Germany

Filed May 7, 1974, Ser. No. 467,825

Claims priority, application Germany, Dec. 10, 1973, 2361385

Int. Cl.² G06G 7/78

U.S. Cl. 235—151.3 **7 Claims**



1. A mechanical-electrical transducer for the simultaneous contactless and reaction-free determination of at least three mutually independent components of displacement of an object coupled to the transducer, including two translational and one rotational component, comprising an oblong ferrite body attached to the object, and at least three different signal sources inductively coupled to the ferrite body and spatially distributed with respect to the ferrite body, wherein said signal sources comprise at least three spatially separated polepieces each of which is equipped with at least one secondary winding of a differential transformer having a primary winding connected to an alternating current supply, and including an electrical analog circuit having at least three difference amplifier and demodulator means, said circuit effecting at least three mutually independent combinations of the outputs of the said at least three spatially separated polepieces to provide at least three mutually independent signals corresponding in sign and magnitude to the said components of displacement of an object from a determined initial position.

3,956,619

PIPELINE WALSH-HADAMARD TRANSFORMATIONS

Joseph L. Mundy, Schenectady, and Reuben E. Joynson, Alplaus, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 31, 1975, Ser. No. 563,820

Int. Cl.² G06F 7/38, 15/34

U.S. Cl. 235—156 **21 Claims**

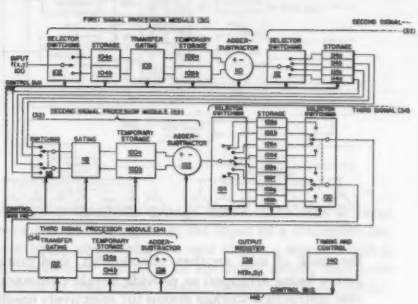
1. A machine for receiving an input sequence signal of serial, data samples, there being 2^p signals in each sequence, and for producing therefrom a serial output signal representative of the sequency ordered coefficients of a binary, orthogonal transform of said input data signals, comprising in combination:

a. an ordered set of p signal processing modules, each of said processing modules having an associated order number i ($i = 1, p$), each of said modules further having a signal input port, a signal output port, and control input ports; said modules being connected in an ordered cascade, wherein said input sequence signal is applied to said signal input port of the first ordered of said modules and said output signal is received from said signal output port of the p^{th} ordered of said modules, each of said signal processor modules further comprising:

an ordered set of 2^i signal storage elements, where i represents the order number of said signal processor module, said storage elements being organized as a first ordered subset comprising the 2^{i-1}lowest ordered storage elements of said set and a second ordered subset comprising the 2^{i-1}highest ordered storage elements in said set;

switching means connected for sequentially applying signals from said input port to each of said storage elements in said ordered set in order and in response to signals from said control ports;

arithmetic circuit means, connected for sequentially receiving pairs of signals from pairs of said storage elements, said pairs of said storage elements including correspondingly ordered storage elements taken from



said first subset and from said second subset, and for producing therefrom, at the output port of said signal processor module and in response to signals from said control port, a sum signal representative of the sum of said pair of signals and a difference signal representative of the difference of said pair of signals;

b. control means connected for providing a plurality of control signals to the control signal ports of each of said signal processor modules, said control signals being connected to induce said arithmetic means to sequentially produce said sum signals and said difference signals from each of said received pairs of signals whereby said signals transform coefficients of said input sequence of data signals are extracted.

3,956,620

ADDER WITH CARRY ENABLE FOR BIT OPERATIONS IN AN ELECTRIC DIGITAL CALCULATOR

George L. Brantingham, and Larry T. Novak, both of Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 26, 1974, Ser. No. 527,506

Int. Cl.² G06F 7/50, 15/02

U.S. Cl. 235—156 **13 Claims**

1. An electronic calculator system comprising:

a. data storage means;

b. control circuitry including an instruction storage means for providing multi-bit command signals which define the operations of the system;

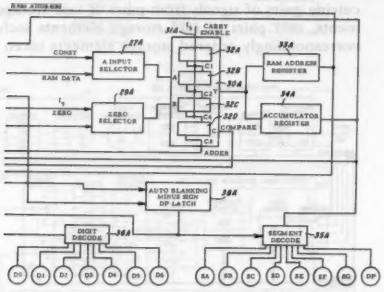
c. an arithmetic unit for performing operations on data including data stored in said data storage means and data stored in said instruction storage means, said arithmetic unit including a plurality of single bit adder sections with each of said adder sections for adding two input bits and an input carry bit from a previous adder section to produce an output sum bit and an output carry bit to a next adder section;

d. means coupling a plurality of selected bits of said instruction storage means as input bits to said arithmetic unit;

e. means coupling first selected bits of said data storage means as input bits to said arithmetic unit and

f. controllable logic means including a plurality of logical AND functioning gates each having first and second

inputs and an output, the first input and output of each said logical AND functioning gates respectively coupling the carry output bit from a previous adder section as the carry input bit of a next adder section with the second input of each of said locical AND functioning gates connected in common to another selected bit of said instruction storage means for selectively enabling or disabling the carry bits from section to section in accordance with



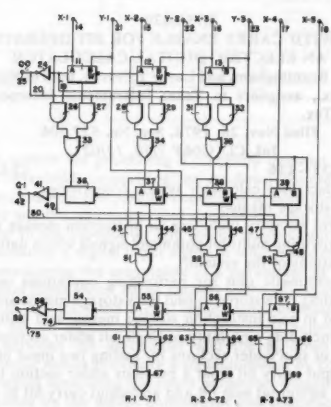
the state of said another selected bit, said control circuitry being arranged to provide toggle commands from said instruction storage means for selectively toggling one or more individual bits in said arithmetic unit wherein each of said toggle commands include said another bit set in a state for said logic means to disable the carry bits from section to section and said first selected bits set to states indicative of the specific ones of said selected bits to be toggled.

3,956,621

ASYNCHRONOUS BINARY ARRAY DIVIDER

William C. Booth, Reisterstown, Md., assignor to The Singer Company, New York, N.Y.

Filed July 22, 1969, Ser. No. 843,501
Int. Cl.² G06F 7/54
U.S. Cl. 235—164 **2 Claims**



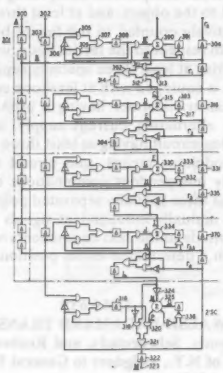
1. A flow-through electronic digital divider comprising a plurality of digital subtractors arranged in a plurality of rows; each of said subtractors having at least a minuend input, a subtrahend input and a borrow input, and at least a difference output and a borrow output; each of said subtractors in a first row defining an order of magnitude of the dividend and each of said subtractors in the other rows defining an order of magnitude of the remainders; first means for applying to the individual minuend inputs of the subtractors in said first row individual dividend digits; second means for supplying to the individual subtrahend inputs of said subtractors individual subtrahend digits; at least one borrow generator in each row of subtractors; means for applying to the inputs of said borrow generator in each row the digits applied to the minuend and subtrahend inputs of that row of subtractors; and means for passing the difference output digits from one subtractor in one row to the minuend input of a subtractor in the subsequent row; said borrow generator in each row comprising means for generating borrow digits from the inputs applied to pairs of subtractors defining adjacent orders of magnitude, said borrow generating means having at least one output and a plurality of inputs, means for connecting said inputs to receive the digital input information applied to the inputs of the pair of subtractors.

3,956,622

TWO'S COMPLEMENT PIPELINE MULTIPLIER

Richard Francis Lyon, Stanford, Calif., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 20, 1974, Ser. No. 534,765
Int. Cl.² G06F 7/54
U.S. Cl. 235—164 **4 Claims**



1. Apparatus for generating the product of an ordered n-bit signed binary data word and an *m*-bit signed multiplier word, $m \geq 2$, said *n*-bit word including a single repetition of the data word sign in the most significant bit position, comprising

A. *m* substantially identical stages each comprising

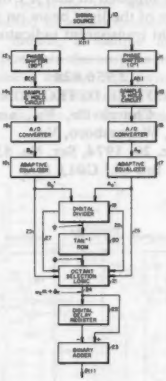
1. means for forming the bitwise product of one bit of said multiplier word and each bit of said data word,
2. means for forming successive partial sums of said bitwise products and partial sums of equal significance generated at preceding stages,
3. means for periodically blanking the one of said partial sums having lowest significance, and
4. means for replacing said blanked significance sum bit with a duplicate of the most significant bit to effect sign extension of the most significant bit, and

B. means for applying input partial sums generated at stage *i* to stage *i*+1 for $i = 1,2, \ldots ,m$, said input partial sums applied at stage 1 being uniformly 0.

3,956,623
DIGITAL PHASE DETECTOR

Thomas E. Clark; Robert J. Tracey, both of San Mateo, and Ronald J. Violet, Belmont, all of Calif., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Oct. 21, 1974, Ser. No. 516,834
Int. Cl.² G06F *15/34*; H03B *3/04*
U.S. Cl. 235—186 **17 Claims**



1. A digital phase detector which periodically detects the phase angle θ_k of a carrier signal in which data are encoded as discrete phase changes, said detector comprising:

means responsive to said carrier signal for separating said carrier signal into its in-phase and quadrature-phase signal components $R_o \cos \theta(t)$ and $R_o \sin \theta(t)$;

means for converting said signal components $R_o \cos \theta(t)$ and $R_o \sin \theta(t)$ at predetermined modulation intervals, into encoded binary signals $R_o \cos \theta$hd k and $R_o \sin \theta_k$;

means responsive to said binary signals for forming said phase angle θ_k that is proportional to the encoded data, said forming means comprising:

dividing means responsive to said binary signals $R_o \cos \theta_k$ and $R_o \sin \theta_k$ for digitally forming the quotient Ψ of said binary signals, such that $|\Psi| \leq 1$;

data look-up means for digitally forming a reference angle signal Φ such that $\Phi = \tan^{-1} \Psi$; and

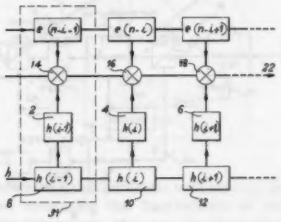
logic means for modifying the reference signal Φ to be the phase angle θ_k, said modification being determined by said binary signals $R_o \cos \theta_k$ and $R_o \sin \theta_k$.

3,956,624
METHOD AND DEVICE FOR THE STORAGE AND MULTIPLICATION OF ANALOG SIGNALS

Luc Audaire, St-Nizier-du-Moucherotte; Joseph Borel, Echirolles; Vincent le Goascoz, Claix, and Robert Poujols, Grenoble, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Apr. 29, 1974, Ser. No. 464,879
Claims priority, application France, May 4, 1973, 73.16246
Int. Cl.² G06G *7/16*
U.S. Cl. 235—194 **11 Claims**

1. A method for term by term multiplication in integrated circuit elements of two ordered series of N terms, said integrated circuit elements including memory elements constituted by field-effect transistors, having a number of layers of different dielectrics between the gate and doped semiconductor substrate of the transistor and wherein, after having performed a discrete sampling of an analog signal at N points, the N amplitudes corresponding to the N points are stored in the form of threshold voltages in N of said transistors, at least one of said two ordered series is derived from the sampling of a function, wherein a multiplication of two corresponding terms is performed by recording the signal which is proportional to one sample of said function in a memory of the multiple dielectric layer type and by applying a given voltage to the gate of said transistor so as to generate a signal which is a linear

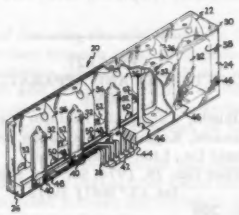


function of the threshold voltage which is in turn a linear function of the writing signal at the input of a multiplier circuit, there being also applied to said circuit a signal which is a linear function of the term of the other series, said term being such as to correspond to said sample of the function.

3,956,625
MULTIPLE FLASHLAMP ARRAY

Robert M. Anderson, Pepper Pike, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 14, 1974, Ser. No. 523,564
Int. Cl.² F21K *5/02*
U.S. Cl. 240—1.3 **4 Claims**

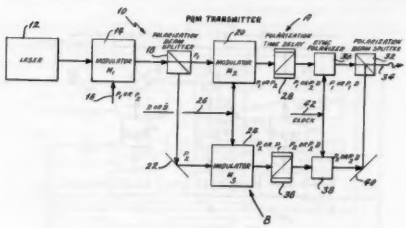


1. In a planar type multiple flashlamp array comprising a base member, a pair of oppositely facing reflector units mounted on said base with each reflector unit having a plurality of outwardly facing reflector cavities disposed in a linear row arranged in side-by-side relationship and facing outwardly in the same direction, a plurality of flashlamps having base ends with each one of said lamps being positioned within a respective one of said reflectors, and a circuitboard member which supports and is operatively associated with said lamps to flash the lamps in sequence, the improvement which comprises having observation aperture means in the form of a pair of openings disposed adjacent said lamp base ends so that the first opening is located in each of said reflector cavities and the second opening is located behind said reflector cavities in the oppositely facing reflector unit and aligned with the first opening with flash indicator means also being aligned with said openings.

3,956,626
PULSE QUATERNARY COMMUNICATION MEANS

Monte Ross, Ladue, Mo., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed June 14, 1973, Ser. No. 369,819
Int. Cl. H04b 9/00
U.S. Cl. 250—199 33 Claims

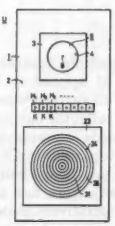


1. Means to modulate pulse optical signals from a pulse source comprising, first, second and third modulator means each having an optical input and an optical output, means associated with the first modulator means to predeterminately polarize the optical pulses received thereat from said source, polarizing beam splitter means positioned to respond to the optical outputs of the first modulator means to separate the output pulses therefrom according to their polarization, said second modulator means being positioned to receive optical output pulses from said beam splitter of one polarization, said third modulator means being positioned to receive optical output pulses from said beam splitter of a different polarization, means associated respectively with said second and third modulator means to delay outputs exiting therefrom of a selected polarization only, other means including synchronous polarizer means and drive means therefor respectively positioned to receive the optical output pulses of said second and third modulator means, and means to optically combine the outputs of said respective synchronous polarizer means to produce a pulse train of optically modulated pulses for transmission.

3,956,627
LIGHT BEAM TARGET AND APPARATUS USING THE SAME

Takayuki Kikuchi, Chigasaki; Yukihiro Kawai, Tama, and Iwao Takanashi, Koganei, all of Japan, assignors to Nishi Nippon Denki Co., Ltd., Osaka, Japan

Filed Oct. 29, 1974, Ser. No. 518,801
Int. Cl.² H01J 39/12
U.S. Cl. 250—209 4 Claims

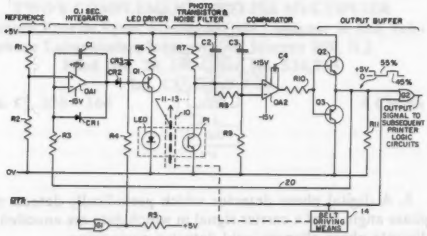


1. An apparatus employing a light beam target comprising means for generating an X-axis light beam center indicating signal indicative of the position of the center of the light beam on a target plate in the X-axis direction based on first and second X-axis electric signals derived from said light beam target and a Y-axis light beam center indicating signal indicative of the position of the center of said light beam on said target plate in the Y-axis direction based on first and second Y-axis electric signals derived from said light beam target; and means for displaying the position of the center of the light beam, said means including a light transparent indicator plate, an XY driver having an output slider movable on an imaginary plane parallel with said light transparent indicator plate and a light-emissive element mounted on the output slider of said XY driver, in which said X- and Y-axis light beam center indicating signals are supplied to said XY driver, whereby the position of the center of the light beam on said target plate is displayed on said light transparent indicator plate.

3,956,628
LIGHT SENSITIVE DETECTION SYSTEM

William A. Hanger, Churchville, Va., assignor to General Electric Company, Waynesboro, Va.

Filed Dec. 20, 1974, Ser. No. 534,597
Int. Cl.² G01J 1/32
U.S. Cl. 250—205 20 Claims



5. A light sensitive detection system operative to detect the presence and absence of moving fingers of known width equally spaced about the circumference of a belt, as they pass a predetermined position, comprising: a source of light; a light responsive element responsive to the light from said source to produce a signal when light impinges thereon; said belt being positioned to interpose said fingers between said source of light and light responsive element; means for moving said belt at a given rate past said predetermined position to produce an output signal of varying amplitude representing the modulation of light by the moving fingers; reference means generating a signal representative of the known ratio between the width of said fingers and the spacing therebetween; integrating means for integrating said output signal, comparing means for comparing said integrated output signal with said reference signal to produce an error signal; and means responsive to said error signal for modifying the light from said source by the amount required to produce an output signal of constant amplitude but having an on-off ratio that is substantially identical to the ratio of the known dimensions of said finger width and spacing.

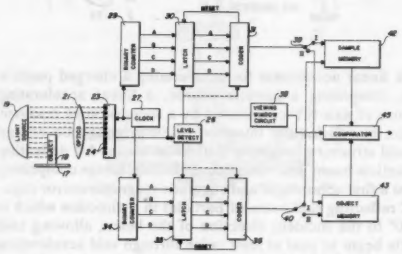
3,956,629
INSPECTION METHOD AND APPARATUS

Thiel J. Gomm, Castle Rock, and Stephen E. Price, Lakewood, both of Colo., assignors to Inex, Inc., Denver, Colo.

Filed June 9, 1975, Ser. No. 584,797
Int. Cl.² G01D 21/04
U.S. Cl. 250—223 R 22 Claims

1. Object inspection apparatus comprising: means for transporting objects, a radiation source directed towards the transport means, an array of photosensors positioned towards the transport means to intercept the radiation, clock means producing a primary frequency and a secondary frequency with the primary frequency being higher than the secondary frequency, the primary frequency output of the clock means being connected to the photosensor array to individually and sequentially interrogate the photosensors and produce from each photosensor an output signal which is a function of the

radiation falling on the photosensor, discriminator means connected to the output from the photosensor array and adapted to produce an output in response to preselected signal characteristics from the photosensor array, a first counter connected to the primary frequency output of the clock means, a first responsive means receiving the output from the first counter and connected to and responsive to the output from the discriminator means, a second counter connected to the secondary frequency output of the clock means, a second responsive means receiving the output from the second counter and connected to and responsive to the output from the discriminator means, a sample memory, comparator means adapted to compare the outputs from the sample memory and the responsive means, first switch means connected between the output of the first responsive means and alternatively connectable to one of the sample memory and the



comparator, and second switch means connected to the output of the second responsive means and alternatively connectable to one of the sample memory and comparator, whereby the first and second switch means may be connected to provide data to the sample memory and an ideal sample object conveyed past the light source to produce a radiation image on the photosensitive array, an output generated from the discriminator means response to distinctive characteristics of the sample object to activate the first and second responsive means and record in the sample memory the counts of the first and second counters corresponding to such characteristics, and thereafter the first and second switch means being connected to provide similar data from objects to be inspected to the comparator, with the data from the responsive means being compared with the data from the sample memory to determine correspondence of the data from the two sources and thus determine the acceptability of the latter objects.

3,956,630

FLUORIMETRIC COAT WEIGHT MEASUREMENT

Frank W. Mellows, Columbia, Md., assignor to Westvaco Corporation, New York, N.Y.

Filed Mar. 14, 1975, Ser. No. 558,446
Int. Cl.² G09K *3/00*
U.S. Cl. 250—302 **9 Claims**

1. A method of measuring the coat weight of a coating applied to a paper substrate or the like in web form comprising:

a. adding an effective amount of a fluorescing optical brightener to the coating formulation to be applied to a substrate;

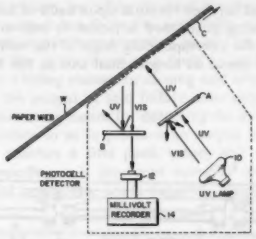
b. applying said fluorescing optical brightener containing coating formulation to samples of said substrate at different coat weights over the coat weight range desired;

c. scanning the coated surface of said coated samples with a UV light source;

d. measuring the fluorescence of the coated samples;

e. comparing the fluorescence readings obtained with the actual coat weights applied to said samples as measured by an independent method;

f. preparing a plot of coat weight vs. fluorescence for the coatings applied; and,



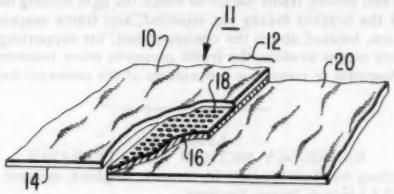
g. thereafter coating said substrate with said coating formulation and measuring the fluorescence of the coating applied for determining the coat weight applied.

3,956,631

PROCESS FOR NON-DESTRUCTIVE INSPECTION

Edward Lewis Crosby, Jr., Indialantic, Fla., assignor to RCA Corporation, New York, N.Y.

Filed June 20, 1974, Ser. No. 481,207
Int. Cl.² G03B *41/16*
U.S. Cl. 250—321 **10 Claims**



1. A method of detecting the adherence of a first member to a second member between which is disposed a layer of adhesive, said adhesive tending to bond said members together only when said adhesive is caused to change from a solid state to a liquid state, said method comprising:

depositing a material in a given pattern on said adhesive when in the solid state,

disposing said solid adhesive between said members,

causing said adhesive to change from a solid state to a liquid state when disposed between said members, the change in state of said adhesive disturbing said given pattern, and

examining said material for the presence of said given pattern.

3,956,632

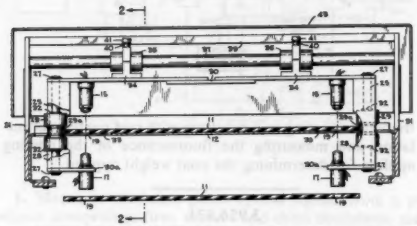
CONVEYOR BELT POSITION MONITORING DEVICE

Derek Hall, and Donald F. Beddell, both of San Jose, Calif., assignors to FMC Corporation, San Jose, Calif.

Filed June 30, 1975, Ser. No. 591,685
Int. Cl.² G01D *21/04*
U.S. Cl. 250—223 R **9 Claims**

1. In an apparatus for monitoring the longitudinal position of a moving conveyor belt, said conveyor belt being provided with a line of light sensitive areas longitudinally spaced therein adjacent to one edge of the belt; said apparatus comprising an appropriately oriented light source lying above said belt; light sensing means responsive to receipt of light from the light source and with the line of sight to said light source aligned substantially perpendicularly to the plane of the conveyor belt so that the line of sight is intercepted by each light sensitive area as the belt moves forward beneath the light source; the

improvement comprising bracket means positioned adjacent to each edge of the belt; pin means mounted in an upright position on each bracket means; a substantially cylindrical roller mounted for free rotation upon each of said pin means, each roller being positioned adjacent to and substantially in contact with the corresponding edge of the belt so that each roller rotates about its longitudinal axis as the belt moves in



engagement therewith, each roller including guide means for maintaining the vertical positions of the edges of the belt as the belt moves; frame means to which the light sensing means and the bracket means are attached; and frame suspension means, located above the conveyor belt, for supporting the frame means to allow the frame means to move transversely in response to transverse movements of the conveyor belt.

3,956,633

RADIOLOGY METHOD AND APPARATUS

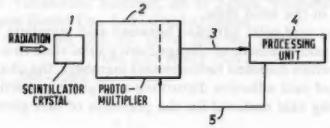
Godfrey Newbold Hounsfield, Newark, England, assignor to E M I Limited, Hayes, England

Filed Apr. 29, 1975, Ser. No. 572,740

Claims priority, application United Kingdom, May 8, 1974, 20259/74

Int. Cl.² G01N *23/08*

U.S. Cl. 250—362 **10 Claims**



1. Radiological apparatus including means for irradiating a body along a plurality of co-planar paths, some of which intersect, detector means for detecting the amount of radiation emergent from the body along each of said paths and for providing output signals indicative thereof, means for processing said output signals to provide a representation of the variation of absorption of said radiation by said body across the plane of said body irradiated by said paths, means for monitoring the amplitude of said output signals and for producing control signals indicative of departure of said signals from a predetermined range of amplitude levels, means for utilising said control signals to compensate for said departure, and means for supplying signals indicative of the compensation to said processing means.

3,956,634

LINEAR PARTICLE ACCELERATOR USING MAGNETIC MIRRORS

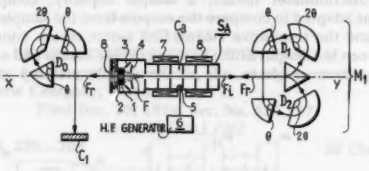
Duc Tien Tran; Dominique Tronc; Jacques Kervizic, and Claude Perraudin, all of Paris, France, assignors to C.G.R - Mev., Paris, France

Filed Jan. 31, 1975, Ser. No. 546,137

Claims priority, application France, Feb. 4, 1974, 74.03657

Int. Cl.² G01K *1/08*; G21G *4/00*; G21K *1/08*

U.S. Cl. 250—396 R **12 Claims**



1. A linear accelerator for accelerating a charged particle beam, comprising a particle source, a linear accelerating structure of axis XY constituted by a succession of resonant cavities, means for the injection of electromagnetic energy into said structure; magnetic deflection means for deflecting said particle beam, said magnetic deflection means comprising at least a first achromatic and stigmatic magnetic mirror capable of reflecting said beam of particles in a direction which is at 180° to the incident direction of the beam, allowing said particle beam to pass at least twice through said accelerating structure; said particle source being arranged on the axis of said accelerating structure; said particle source having a form such that it can be traversed along its axis by said accelerated beam having effected at least two passes through said accelerating structure.

3,956,635

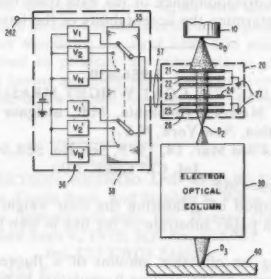
COMBINED MULTIPLE BEAM SIZE AND SPIRAL SCAN METHOD FOR ELECTRON BEAM WRITING OF MICROCIRCUIT PATTERNS

Tai-Hon Philip Chang, Chappaqua, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 13, 1975, Ser. No. 586,697

Int. Cl.² G01N *23/04*

U.S. Cl. 250—492 A **10 Claims**



1. A method of fabricating integrated circuits in a computer controlled electron beam system comprising the steps of:

providing a programmed integrated circuit pattern;

directing a beam of electrons of a predetermined diameter toward a target so as to impinge on the target in accordance with said integrated circuit pattern;

interposing an electron optical imaging unit in the path of said beam of electrons;

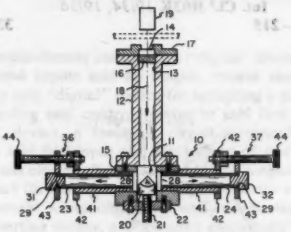
operating said imaging unit so as not to alter the predetermined diameter of the beam of electrons;
outlining the circuit pattern;
operating said imaging unit so as to magnify the diameter of the beam of electrons; and
filling in the inside of the circuit pattern.

3,956,636

METHOD AND APPARATUS FOR INSPECTING AND SORTING BUTTONS

Charles H. Williams, Export, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Feb. 21, 1974, Ser. No. 444,498
Int. Cl.² G01N *21/32*
U.S. Cl. 250—572 **15 Claims**



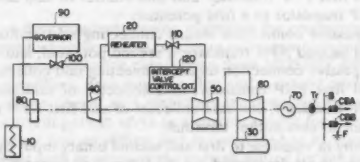
8. An apparatus for inspecting buttons and the like comprising a main chamber having a first aperture opening with a diameter substantially equal to the diameter of a button to be inspected, the center of said aperture defining the optical axis of said chamber; means for aligning said button at said first aperture; a light source for directing a beam through said aperture and along said optical axis; a light reflecting member positioned in said chamber along said axis for reflecting said light normal to said axis; four light receiving members, each having first and second ends and spaced apart 90° from two other of said members and in a plane normal to said axis, the first end of each member comprising a second aperture positioned adjacent said light reflecting means and said second end each including a photosensor for detecting said reflected light through said second aperture to provide an output signal; and a logic circuit electrically connected to each of said photosensors for comparing said output signals and producing an inspection signal.

3,956,637

INTERCEPT VALVE CONTROLLING METHOD AND SYSTEM FOR USE IN A HEAT POWER PLANT

Hiroaki Aotsu; Akira Isono, and Yoshihiro Uchiyama, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 18, 1973, Ser. No. 425,838
Claims priority, application Japan, Dec. 20, 1972, 47-127205
Int. Cl.² H02J *1/10*
U.S. Cl. 290—40 R **21 Claims**



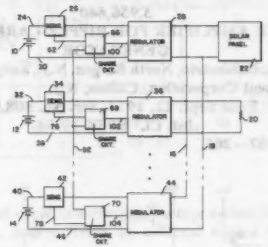
11. An intercept valve controlling system adapted for use in a heat power plant having a turbine plant including a high-pressure turbine and intermediate-pressure turbine; a generator; a reheater and an intercept valve both disposed between the high-pressure and intermediate-pressure turbines; and transmission system including at least two transmission circuits on an output bus from the generator; said controlling system comprising failure detecting means for producing an output upon the occurrence of a fault on said transmission system; valve closing means for closing said intercept valve in response to the output of said failure detecting means; inner rotor angle detecting means for detecting the inner rotor angle of said generator so as to produce an output when the inner rotor angle reaches a first peak value; and valve opening means for opening said intercept valve in response to the output of said inner rotor angle detecting means.

3,956,638

BATTERY PARALLELING SYSTEM

Allan F. Ahrens, Canyon Country, and Gilbert I. Cardwell, Palos Verdes Peninsula, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 20, 1974, Ser. No. 534,977
Int. Cl.² H02J *3/32*
U.S. Cl. 307—48 **9 Claims**



1. A battery paralleling system for connecting a plurality of batteries in parallel and for regulating the current from each battery comprising:
a plurality of battery lines each for connection to a battery and for receiving battery current, said battery lines being connectable to a buss for supplying a load connected to the buss;
a battery current regulator serially connected in each battery line for limiting the battery current in each battery line;
a current sensor connected in each battery line for sensing the battery current in each battery line; and
a sharing circuit connected to each current sensor and to each current regulator for controlling each regulator so that the current in each battery line is substantially equal to the current in each of the other battery lines.

3,956,639

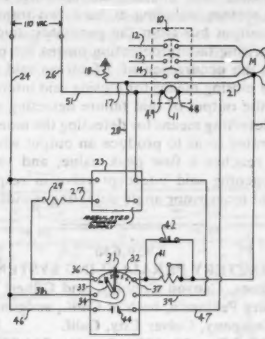
GROUND MONITOR FOR ELECTRICAL APPARATUS

John W. Ramsay, 910 Second Ave. North, Birmingham, Ala. 35202

Filed Feb. 24, 1975, Ser. No. 552,414
Int. Cl.² H02H *3/00*
U.S. Cl. 307—94 **3 Claims**

1. In apparatus for controlling the supply of energy to an electrically driven machine wherein the circuitry associated with the machine includes power supply circuits, a grounding circuit, and a pilot circuit,
a. means to impress a predetermined substantially constant DC voltage on a circuit embodying the grounding circuit and said pilot circuit,
b. an ammeter in said grounding and pilot circuits set forth in (a) above having a set of normally open contacts which

close when the resistance in said circuits is less than a predetermined value, and

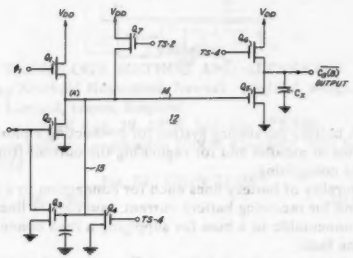


c. means controlling the supply of energy to said machine under control of said contacts.

3,956,640
BUFFER AMPLIFIER FOR RIPPLE-CARRY BINARY GENERATOR

Richard B. Rubinstein, North Bergen, N.J., assignor to General Instrument Corporation, Clifton, N.J.

Filed Sept. 22, 1974, Ser. No. 508,080
Int. Cl.² H03K *19/08*
U.S. Cl. 307—205 **3 Claims**

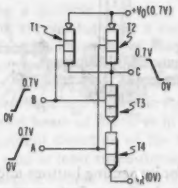


1. A buffer-amplifier which comprises:
first (Q_1) and second (Q_2) field-effect transistors serially connected between an external supply source (VDD) and ground;
means, connected to the gate electrode of said first transistor (Q_1), for supplying a train of clock pulses of a first phase (ϕ_1) from an external clock pulse generator;
means, connected to the gate electrode of said second transistor (Q_2), for pre-charging said gate electrode in a positive-direction during a first time slot (TS-4) synchronized with said clock pulses of a first phase (ϕ_1) and for subsequently supplying a negative-going input pulse thereto during a second time slot (TS-1) synchronized with said clock pulses (ϕ_1);
a third field-effect transistor (Q_3) connected between the gate electrode of said second transistor and ground;
a feedback circuit (13) connected between the juncture of the drain electrode of said second transistor and the source electrode of said first transistor and the gate electrode of said third transistor (Q_3);
fourth (Q_4) and fifth (Q_5) field-effect transistors serially connected between said supply source (VDD) and ground, the gate electrode of said fifth transistor being connected to the juncture between said first and second transistors, the output of said amplifier being taken from the drain electrode of said fifth transistor (Q_5); and
means, connected to the gate electrode of said fourth transistor (Q_4) , for supplying a pulse train to said fourth transistor during said first time slot (TS-4).

3,956,641
COMPLEMENTARY TRANSISTOR CIRCUIT FOR CARRYING OUT BOOLEAN FUNCTIONS

Horst H. Berger, Sindelfingen, and Siegfried K. Wiedmann, Stuttgart, both of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 11, 1975, Ser. No. 549,116
Claims priority, application Germany, May 31, 1974, 2426447
Int. Cl.² H03K *19/34*, *19/36*
U.S. Cl. 307—215 **33 Claims**



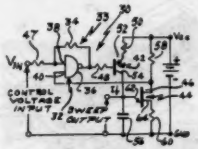
1. A logic circuit for carrying out a boolean function of at least two input variables, said logic circuit comprising:
a first PNP transistor having a collector, base and emitter;
a second PNP transistor having a collector, base and emitter;
a first NPN transistor having a collector, base and emitter;
a second NPN transistor having a collector base and emitter;
a first input terminal adapted to receive a first binary input signal;
a second input terminal adapted to receive a second binary input signal;
an output terminal;
first passive connection means connecting in common said first input terminal, said base of said first PNP transistor, and said base of said first NPN transistor;
second passive connection means connecting in common said second input terminal, said base of said second PNP transistor, and said base of said second NPN transistor;
third passive connection means connecting said emitter of said first NPN transistor to said collector of said second NPN transistor;
fourth passive connection means connecting said emitter of said first PNP transistor and said emitter of said second PNP transistor to a first potential;
fifth passive connection means connecting said emitter of said second NPN transistor a second potential; and
sixth passive connection means connecting said collector of said first PNP transistor, said collector of said second PNP transistor, and said collector of said first NPN transistor to said output terminal,
whereby in response to first and second binary input signals respectively impressed on said first and second input terminals said output terminal manifests a binary output signal which is the boolean function of said first and second binary inputs.

3,956,642

VOLTAGE-CONTROLLED SWEEP MULTIVIBRATOR

Stephen R. Troy, 104-20 89th Ave., Richmond Hill, N.Y. 11418

Filed Jan. 20, 1975, Ser. No. 542,639
Int. Cl.² H03K 4/08, 3/335
U.S. Cl. 307—228 18 Claims



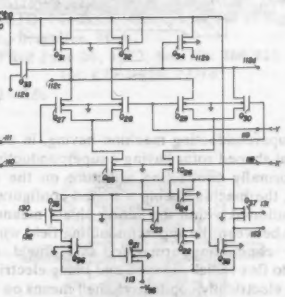
1. A multivibrator compising a "digital" device having first and second inputs and an output, means electrically connected to said "digital" device for accepting a control voltage and directing said control voltage to said first input of said "digital" device, a feedback circuit electrically connected between said first input and said output of said "digital" device, means electrically connected to said output of said "digital" device for converting said "digital" device output voltage into a current, a capacitor electrically connected to said voltage converting means, a DC source electrically connected to said voltage converting means, and a voltage sensitive switching means electrically connected between said capacitor and said second input of said "digital" device whereby said multivibrator is capable of extremely high-speed operation and producing an exceptionally linear sweep waveform.

3,956,643

MOS ANALOG MULTIPLIER

Larry R. Hite, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 12, 1974, Ser. No. 505,437
Int. Cl.² H03B 17/00
U.S. Cl. 307—229 20 Claims



1. A four quadrant analog multiplier for producing an output product voltage from two input voltages which comprises:

a. a semiconductor chip having three MOSFET differential amplifiers, each having a first and a second current path where one of said amplifiers is connected from its first current path to serve as a current source for a first of the other two amplifiers and is connected at its second current path to serve as the current source for the second of said other two amplifiers,

b. a current source terminal leading to said one of said amplifiers,

c. means to apply one of said input voltages equally and oppositely to modulate the current in the two paths of said one amplifier,

d. means to apply the other of said input voltages to modulate the current in the first path of each of said other two amplifiers equal and opposite to the modulation of the current in the second path of each of said other two amplifiers, and

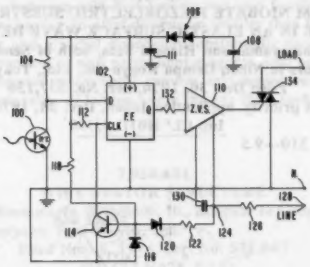
e. means to generate the output product voltage by combining currents from paths oppositely modulated in said other two amplifiers.

3,956,644

INTEGRAL CYCLE, PRECISE ZERO VOLTAGE SWITCH

Bhagvantrao G. Zambre, Palo Alto, Calif., assignor to Elma Engineering, Palo Alto, Calif.

Filed Oct. 10, 1974, Ser. No. 513,719
Int. Cl.² H03K 17/06, 5/153
U.S. Cl. 307—252 UA 5 Claims



1. An integral cycle, precise zero voltage switch for supplying alternating current from an external source to a load comprising

means for generating a command signal,

means for generating a clock signal just before the beginning of each half cycle of a predetermined polarity of the alternating current,

bistable logic means responsive to the command and clock signals for producing a logic signal beginning at the simultaneous occurrence of the command and clock signals and ending with the occurrence of the clock signal alone, and

switching means for supplying the alternating current to the load beginning and ending from the zero crossing of the alternating current and provided that the switching means is enabled by the logic signal.

3,956,645

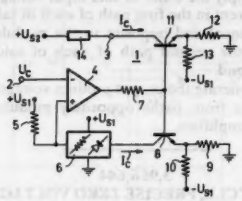
CONTROLLABLE CURRENT SOURCE

Dirk Boer, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 392,770, Aug. 29, 1973, abandoned.
This application Mar. 14, 1975, Ser. No. 558,211
Claims priority, application Netherlands, Sept. 9, 1972, 7212293
Int. Cl.² H03K 1/14
U.S. Cl. 307—264 7 Claims

1. A controllable current source comprising a first supply input terminal, control input means for receiving a control voltage, and an output terminal; an operational amplifier having a first high impedance input coupled to said control input means, a second input, and an output; a first resistor coupled between said second input and said supply input; current mirror feedback means comprising a first and second transistors each having control and collector electrodes, said control electrodes being coupled together; a non-linear resistance network coupled between said first transistor collector

and said amplifier second input, the control electrode of said first transistor being coupled to said amplifier output, and said second transistor collector being coupled to said output terminal.

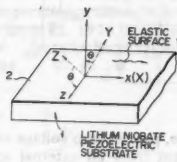


3,956,646

LITHIUM NIOBATE PIEZOELECTRIC SUBSTRATE FOR USE IN AN ELASTIC SURFACE WAVE DEVICE

Kimio Shibayama, and Hiroaki Sato, both of Sendai, Japan, assignors to Nihon Dempa Kogyo Co., Ltd., Tokyo, Japan

Filed Dec. 30, 1974, Ser. No. 537,139
Claims priority, application Japan, Dec. 28, 1973, 48-846
Int. Cl.² H01L 41/18
U.S. Cl. 310—9.5 3 Claims



1. A lithium niobate acoustic surface wave substrate having an acoustic surface wave propagation surface parallel to the lithium niobate crystalline X-axis, the normal of said acoustic surface wave propagation surface intersecting the lithium niobate crystalline Y-axis at an angle θ,

the improvement wherein the intersecting angle θ of the normal of said acoustic surface wave propagation surface and the lithium niobate crystalline Y-axis ranges from 125.6° to 130.1°.

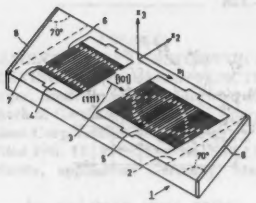
3,956,647

ACOUSTIC SURFACE-WAVE DEVICES USING MONO CRYSTALLINE BISMUTH SILICON OXIDE SUBSTRATE

Richard Frank Mitchell, Kingston; Eileen Read, High Wycombe, and Richard Stevens, Copthorne, all of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 15, 1974, Ser. No. 514,472
Claims priority, application United Kingdom, Oct. 12, 1973, 47745/73
Int. Cl.² H01L 41/04
U.S. Cl. 310—9.5 5 Claims

1. An acoustic surface-wave device comprising a wafer of monocrystalline bismuth silicon oxide having first and second major surfaces and formed so that the first major surface of said wafer which constitutes the acoustic surface-wave propagation surface of the device lies substantially parallel to the crystallographic (111) plane or a crystallographically-equivalent plane, as herein defined, a launching and a receiving interdigital transducer coupled to said first major surface respectively to launch and to receive acoustic surface waves in any one of the directions $[\bar{1}01]$, $[\bar{1}10]$ and $[0\bar{1}\bar{1}]$ or equivalent directions as herein defined in said (111) plane or in any one of the crystallographically-equivalent directions, as herein defined, in said equivalent plane, and means for attenuating bulk waves directed at the second major surface of the wafer, said transducers being spaced apart a distance such that bulk shear waves having a particle motion inclined to said first major surface and launched by one of said transducers in the direction of the other transducer are substantially prevented from reaching said other transducer.

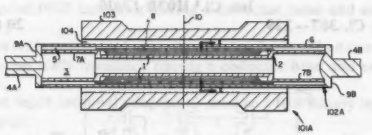


3,956,648

SUPERCONDUCTING MACHINE HAVING FLEXIBLE SHIELD MEANS OPERABLE TO PROTECT THE SUPERCONDUCTING FIELD WINDING AGAINST TRANSIENTS

James L. Kirtley, Jr., Brookline, and Gerald L. Wilson, Wayland, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Nov. 13, 1974, Ser. No. 523,603
Int. Cl.² H02K 9/00
U.S. Cl. 310—40 R 13 Claims



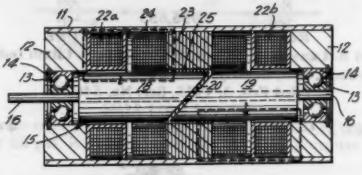
1. A superconducting machine having, in combination: a cylindrical-shaped rotor having a superconducting field winding; a normally conducting armature on the stator of the machine, the machine being a nested configuration with the rotor positioned within the stator; shield means disposed on the rotor between the superconducting field winding and the normally conducting armature, said shield means being adapted to flex radially inward and being electrically conductive; and electrically conductive shell means on the rotor and disposed between the superconducting field winding and the shield means, the shell means being spaced radially inwardly from the shield means and being supported against radial loading by the cold parts of the rotor but being thermally isolated from said cold parts, the magnetic field from the superconducting field winding linking both the shield means and the conductive shell means, transient radial loading of the shield means due to transient conditions acting to move the shield means radially inward toward the shell means thereby decreasing the space therebetween and compressing the magnetic field in said space to distribute the transient radial loading to the conductive shell means and thence to said cold parts of the rotor.

3,956,649

BRUSHLESS ROTARY SIGNAL TRANSDUCER

Alvin J. Silverman, Massapequa, N.Y., assignor to Aeroflex Laboratories, Inc., Plainview, N.Y.

Filed June 20, 1974, Ser. No. 481,431
Int. Cl.² H02K 39/00
U.S. Cl. 310—111 26 Claims



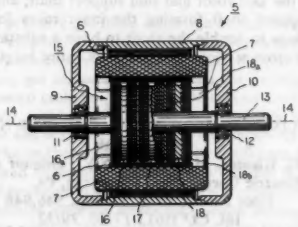
1. A brushless rotary signal transducer comprising a housing formed of a magnetic permeable material and defining an axis, said housing defining at least one magnetically permeable wall closing a first end of same, rotor means disposed in said housing substantially on said axis and having a rotor core at least in part formed of magnetic permeable material and a drive shaft for supporting said rotor core, said shaft projecting from said housing substantially along the axis thereof and being adapted to be rotatably driven; stator means within said housing in substantial axial alignment with said excitation winding and including a yoke concentrically disposed in said housing between said housing and said rotor; an excitation winding axially disposed between said housing end wall and said stator means, said excitation winding being adapted to generate a flux field upon the application of an excitation signal thereto, and at least one stator winding wound on said stator yoke, at least a portion of said rotor core in radial registration with said stator yoke being magnetically asymmetrically distributed about said axis to define a rotating closed path for said flux field with at least said stator means, housing and magnetically permeable portion of said rotor core for the generation of signals in said stator winding representative of the rotary position of said rotor core and said excitation signal.

3,956,650

LAMINAR-ROTOR SYNCHRONOUS INDUCTOR MOTOR

John H. Field, II, Needham, Mass., assignor to Sigma Instruments Inc., Braintree, Mass.

Filed June 26, 1972, Ser. No. 266,421
Int. Cl.² H02K 21/14
U.S. Cl. 310—156 8 Claims



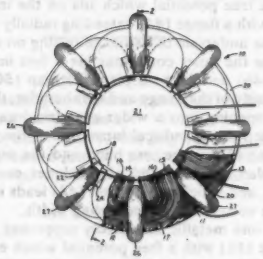
1. A motor comprising a stator having a plurality of radially projecting teeth, a rotor mounted within said stator for rotation about an axis, said rotor including a plurality of wafer-shaped lamina having peripherally arranged teeth opposing the radially projecting teeth of said stator, a wafer-shaped axially magnetized permanent magnet arranged adjacent said lamina, a second plurality of wafer-shaped lamina sandwiching the permanent magnet between the second plurality of lamina and the first plurality of lamina, said second plurality of lamina having a plurality of radially projecting teeth spaced from the radially projecting teeth on said stator, a wafer-shaped magnetic spacer coaxially adjacent said second plurality of lamina, a third plurality of lamina coaxially adjacent said spacer and having a plurality of peripherally arranged teeth extending radially, a second axially magnetized permanent magnet coaxially adjacent said third plurality of lamina, a fourth plurality of lamina coaxially arranged adjacent said second permanent magnet and having a plurality of radially extending teeth, said lamina being formed of soft magnetic material so as to form pole shoes for said permanent magnets, said permanent magnets extending substantially to the roots of the teeth of said pluralities of lamina, said permanent magnets having a lesser axial dimension than radial dimension, said lamina each being thinner than the axial dimension than said permanent magnets, said lamina and said permanent magnets and said spacer being secured to each other by bonding means, the bonding means and the lamina and the permanent magnets and the spacer forming substantially the entire axial dimension between said first lamina and said fourth lamina, said spacer having an axial dimension smaller than the radial dimension and a radial dimension substantially equal to the radial dimension of said permanent magnets, said permanent magnet and said spacer being annular, said lamina being annular, each plurality of lamina being thicker than each magnet.

3,956,651

WIRE STATOR STRUCTURE

Allen A. Brammerlo, Sycamore, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed Nov. 5, 1974, Ser. No. 521,047
Int. Cl.² H02K 1/18
U.S. Cl. 310—218 16 Claims



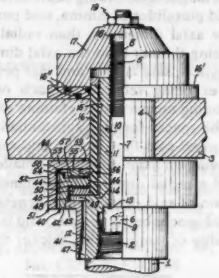
1. A stationary member for a dynamoelectric machine comprising a plurality of generally U-shaped first segments and second segments each terminating in spaced ends and constituted by a plurality of elongate ferromagnetic filaments and wherein the first segments contain more ferromagnetic material than the second segments, the first segments and second segments being arranged in a generally contiguous relationship to form a magnetic core having discrete polar areas with the spaced ends generally defining a bore within the magnetic core, and at least one winding extending generally about a respective one of the first segments and the second segments between the spaced ends thereof.

3,956,652

DEVICE ON A METALLIC GAS-DISCHARGE VESSEL FOR CURRENT LEAD-IN THROUGH ITS WALL

Horst Rordorf, Weiningen, Switzerland, assignor to Elektrophysikalische Anstalt Bernard Berghaus, Vaduz, Liechtenstein

Filed Jan. 28, 1975, Ser. No. 544,901
Claims priority, application Switzerland, Jan. 29, 1974, 1173/74
Int. Cl.² H01J 37/04, 37/32
U.S. Cl. 313—19 5 Claims



1. A device on a metallic gas discharge vessel used as a current lead-in through the vessel wall, particularly for the treatment of heavy workpieces by means of glow discharges at high operating voltages, with a cylindrical inner conductor (5, 10) enclosed by an insulating body (16), communicating protective gaps of different widths and cylindrical configuration being provided in order to protect the insulating body (16) against the action of glow discharges, comprising:

a mechanically unstressed insulating sleeve (16) as an insulating body which encloses the cylindrical inner conductor (5, 10).

a metallic insulatedly supported inner shielding sleeve (40) with a free potential which sits on the insulating sleeve (16) with a flange (44) extending radially inwards, which has the underside of its flange resting on a shoulder (13, 14) on the inner conductor via a first insulating spacer disc (46) and forms a plane flat gap (50) between the underside of the flange and the shoulder, the said first gap (50) opening into a wider cylindrical gap portion (48) between the cylindrical inner side of the inner shielding sleeve (40) on the one hand and the outer side of the shoulder (13, 14) and of the inner conductor on the other, and which gap portion (48) leads into the interior of the vessel with an increasing width,

at least one metallic insulatedly supported outer shielding sleeve (51) with a free potential which encloses at least part of the inner shielding sleeve (40) without contacting it and which has an inwardly extending flange (53) sitting on the insulating sleeve (16), the said outer shielding sleeve (51) resting with the upper side of its flange on a second insulating spacer disc (59) which adjoins the vessel wall (3) and forms a plane flat gap (60) between the latter and the upper side of the flange which opens into the interior of the vessel and which outer shielding sleeve (51) has the underside of its flange resting against a third insulating spacer disc (56) which is borne by the flange (44) of the inner shielding sleeve (40) forming a plane flat gap (57, 61) between the flanges of the outer and the inner shielding sleeves which flat gap (57, 61) has its radially outer end opening into a wider cylindrical gap (54) between the cylindrical portions (52, 42) of the outer and the inner shielding sleeve and which cylindrical gap (54) leads into the interior of the vessel,

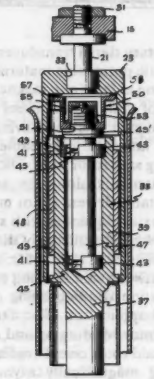
and the inner conductor herein being hollow and provided with a tightening screw (5) extending through it, the said screw being screwed into a cover (17) located outside the container wall with an electrically insulating vacuum-tight intermediate layer (16') so that, when the tightening screw is screwed down, the shoulder (13, 14) of the inner conductor forces the spacer discs (46, 56, 59) and the flanges located between them (44, 53) against the vessel wall.

3,956,653

ROTATING ANODE X-RAY TUBE

Albert B. Lauwasser, Skokie, Ill., assignor to Litton Industrial Products, Inc., Beverly Hills, Calif.

Filed Feb. 3, 1975, Ser. No. 546,388
Int. Cl.² H01J 35/10
U.S. Cl. 313—60 4 Claims



1. An x-ray tube comprising:

a cathode;

a rotating anode mounted on a stem, said stem being integrally connected to a hollow cylindrical rotor;

a support shaft mounted within the interior of said rotor, said shaft being rotatively supported through ball bearings by a base element, said support shaft being interconnected to said rotor and anode structure by means forming a thermal barrier between the anode structure and the support shaft, wherein said thermal barrier means comprises a separate element made of low thermal conductive metal, said separate element being a cup-shaped member having an upper and lower surface respectively interfaced with the said rotor and said support shaft; and

said support shaft forming the inner races for said ball bearings to enable the shaft to have a substantially constant cross-section throughout its entire length.

3,956,654

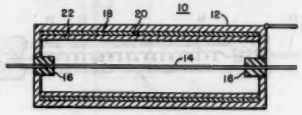
LONG LIVED PROPORTIONAL COUNTER NEUTRON DETECTOR

Charles H. Gleason, Horseheads, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 3, 1975, Ser. No. 546,848
Int. Cl.² H01J 17/20, 39/32
U.S. Cl. 313—61 D 3 Claims

1. A proportional neutron detector comprising an hermetically sealed member having a high neutron cross-section, neutron absorptive coating on the interior surface thereof, and a generally centralized electrically conductive collector electrode disposed within the sealed member and insulatingly brought through the member for connection to a potential source, a fill gas of noble gas and a small portion of a polyatomic fill gas at predetermined pressure within said sealed member which fill gas is ionizable by the radiation emitted by

the neutron absorptive coating upon neutron capture, the improvement wherein a thin isolation film of selected metal or metal oxide, which is substantially transmissive to neutrons



and is non-reactive with the dissociation products of the polyatomic fill gas, is disposed over the neutron absorptive coating.

3,956,655

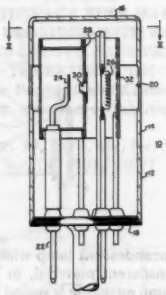
ULTRAVIOLET RADIATION SOURCE

Jack L. Pevo, Odessa, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 23, 1974, Ser. No. 535,628

Int. Cl.² H01J *61/33*; H01K *1/28*

U.S. Cl. 313—112 **5 Claims**



1. A low pressure gas filled discharge device for generating ultraviolet radiation for spectrographic analysis, comprising a hermetically sealed envelope, with a selected ultraviolet radiation emitting gas at low pressure filling the envelope, a filamentary heated cathode and an anode spaced from the cathode disposed within the envelope, with baffling means disposed about and between the cathode and anode for constricting the discharge therebetween to excite the fill gas and generate the desired ultraviolet radiation, and wherein the hermetically sealed envelope comprises a generally cylindrical ultraviolet transmissive vitreous envelope portion having a closed top envelope portion, and a vitreous glass base member sealed to the bottom of the cylindrical envelope portion, with electrical lead-ins sealed through the base member and operatively connected to the cathode, anode, and baffle means, with the cylindrical envelope being relatively thin and having an even thinner circumferential wall highly ultraviolet transmissive portion, spaced about the anode and cathode discharge producing portions of the tube, wherein the said even thinner circumferential wall portion is from about 0.005 inch to about 0.020 inch.

3,956,656

DISCHARGE TUBE HAVING TWO INTERNAL ELECTRODES

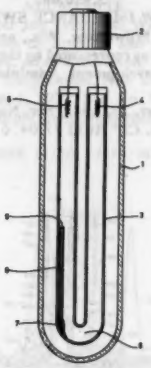
Leo Modest Sprengers, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 29, 1974, Ser. No. 528,075

Claims priority, application Netherlands, Dec. 19, 1973, 7317359

Int. Cl.² H01J *61/24*

U.S. Cl. 313—181 **9 Claims**



1. A lamp having a discharge tube having a storage station for a liquid, at least two internal electrodes, a material containing a metal which is at least partly a liquid during operation of said lamp, said material being disposed in said tube, and means for transporting liquid from said storage station during lamp operation which comprise a capillary disposed in said discharge tube having first and second open ends, said first end being in fluid communication with said storage station and said second end being disposed in said discharge chamber intermediate said two internal electrodes, the second end of the capillary having a higher temperature than said first end.

3,956,657

PRE-IGNITION GAP

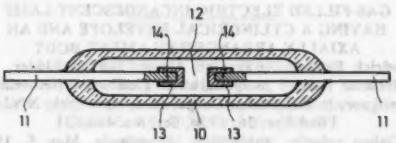
Gert Siegle, Renningen, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Continuation of Ser. No. 379,108, July 13, 1973, abandoned. This application Jan. 27, 1975, Ser. No. 544,825

Claims priority, application Germany, July 18, 1972, 2235117

Int. Cl.³ A47B *81/00*

U.S. Cl. 313—214 **12 Claims**



1. In an ignition system for combustion engines, particularly a coil ignition system, a pre-ignition gap for use at an average sparking voltage between about 2 and 16 kilovolts comprising means defining a closed compartment; a pair of electrodes extending into said compartment and having spaced free ends therein with the spacing between said free ends being in the range of about 0.5 to 5 millimeters, said electrodes in the region of sparking, being composed of or having a surface

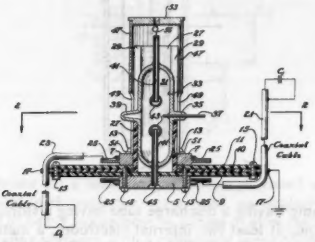
portion composed of at least one substance selected from the group consisting of titanium, zirconium, hafnium, columbium and tantalum; and a body of gas accommodated in said compartment at a pressure between about 0.8 and 10 bars and surrounding said free ends, said gas including at least one noble gas and containing at most about 10 percent by weight of hydrogen, at most about 0.1 percent by weight of oxygen and at most about 0.1 percent by weight of water.

3,956,658

LOW IMPEDANCE SWITCH

Donald F. Hornig, Milwaukee, Wis., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Nov. 28, 1945, Ser. No. 631,419
Int. Cl.² H01J *17/04, 61/06*
U.S. Cl. 313—217 **2 Claims**



1. A low inductance switch comprising a pair of spaced apart, annularly shaped, plate members of conducting material supported in substantially parallel, insulated relationship, said plate members being provided with a plurality of radially extending, spoke-like extensions whereby said members may be connected into a plurality of electrical circuits, and an electrical discharge means connected across said spaced plate members for effecting the simultaneous closing of the electrical circuits connected thereto, said electrical discharge means including an elongated, sealed envelope which contains an ionizable gas and which is supported on one of said plate members with the major axis of said envelope extending generally perpendicular to the plane of said plate members, a pair of elongated, spaced apart, insulated electrodes supported within said envelope and extending axially thereof, one of said electrodes being connected to each of said plate members, and a third, firing or trigger electrode supported within said envelope intermediate said main electrodes and being insulated from said main electrodes.

3,956,659

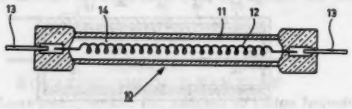
GAS-FILLED ELECTRIC INCANDESCENT LAMP HAVING A CYLINDRICAL ENVELOPE AND AN AXIALLY ARRANGED FILAMENT BODY

Friedrich Hermann Raymönd Almer; Jan de Ridder, and Germain Remi T'Jampens, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 26, 1974, Ser. No. 464,631
Claims priority, application Netherlands, May 5, 1973, 7306307
Int. Cl.² H01K *5/02*
U.S. Cl. 313—222 **6 Claims**

1. A gas filled electric incandescent lamp having a cylindrical envelope and an axially arranged filament body of tungsten, characterized in that the filling pressure is more than 1 at. and the internal diameter of the envelope is less then 3.5 mm, satisfying the condition $d_{int} = A \cdot T_f^{\alpha} \cdot T_g^{\beta} \cdot a^{\gamma} \cdot P_o^{\delta}$ in which A, α, β, γ and δ are constants which are dependent on the nature of the filler gas and the filling pressure, and

T_f = the temperature of the filament body (in °k)
T_g = the temperature of the wall of the envelope (in °k)
a = the filament diameter (in mm) and
P_o = the filling pressure (in atm.) and d_{int} is expressed in mm.



said lamp having an argon filling wherein P_o is greater than 1 atmosphere and less than 4 atmospheres and the constants have the following values:

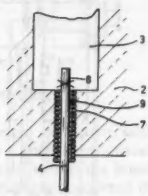
$A = 0.764$
$\alpha = 0.096$
$\beta = 0.183$
$\gamma = 0.448$
$\delta = -0.421$

3,956,660

ELECTRIC INCANDESCENT LAMP

Leo Frans Maria Ooms, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 12, 1974, Ser. No. 532,310
Claims priority, application Netherlands, Jan. 21, 1974, 7400762
Int. Cl.² H01K *1/36*
U.S. Cl. 313—222 **3 Claims**



1. An electric incandescent lamp which comprises a lamp envelope of a transparent material, in which a filament is stretched, which lamp envelope is sealed by at least one pinch seal in which at least one thin foil is sealed, which foil is welded to two or more conductors extending outside the pinch seal, characterized in in that the pinch seal comprises means which form a cavity which adjoins the point of the weld of the foil to at least one of the conductors, wherein said means is formed by a sheath-like member which surrounds the conductor and the inner diameter of which is at least 100 microns larger than the diameter of the conductor.

3,956,661

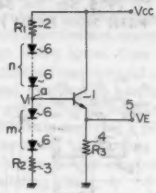
D.C. POWER SOURCE WITH TEMPERATURE COMPENSATION

Jyunji Sakamoto; Norio Imaizumi, and Eisuke Shiratani, all of Gunma, Japan, assignors to Tokyo Sanyo Electric Co., Ltd., Osaka, both of and Sanyo Electric Co., Ltd., Osaka, Japan

Filed Nov. 6, 1974, Ser. No. 521,544
Claims priority, application Japan, Nov. 20, 1973, 48-135311[U]; Apr. 3, 1974, 49-38423[U]
Int. Cl.² G05F *1/58*
U.S. Cl. 307—297 **4 Claims**

1. An improved D.C. power source comprising a transistor, the collector of which is connected to a power source of Vcc volt and the emitter of which is connected to ground, a first series circuit having a first resistor with a resistance R_1 and n

number diodes connected between the power source and the base of said transistor, a second series circuit having a second resistor with a resistance R_2 and m number of diodes connected between the base of said transistor and ground, an output terminal connected to the emitter of said transistor for providing stabilized voltage of V_E volt, and values of m and n satisfying the following equations:



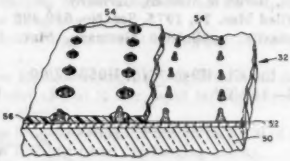
$$\frac{R_1}{R_2}(m-1) = n+1$$

$$V_E = \frac{Vcc}{1+\frac{R_1}{R_2}}.$$

3,956,662
CATHODE RAY STORAGE TUBE HAVING A TARGET DIELECTRIC PROVIDED WITH PARTICULATE SEGMENTS OF COLLECTOR ELECTRODE EXTENDING THERETHROUGH

Gerald E. McTeague, Portland, and Kenneth R. Stinger, Hillsboro, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Apr. 30, 1973, Ser. No. 356,029
Int. Cl.² H01J 29/41
U.S. Cl. 313—398 16 Claims

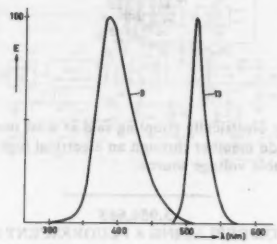


1. A cathode ray storage tube comprising:
an insulative support member having a conductive layer on an inside surface of said support member, said inside surface being smooth and nonanomalous;
connection means for providing said conductive layer with a predetermined voltage level;
a dielectric layer for storing a charge pattern, said layer being located on one side of said conductive layer;
a multiplicity of spaced conductive collector electrodes in the form of particulate material having inner ends connected to said conductive layer, said collector electrodes extending from said conductive layer through said dielectric layer at least to an opposite side thereof to provide an equipotential surface on said opposite side of said dielectric layer at substantially the same voltage level as said conductive layer, said dielectric layer being substantially continuous except where interrupted by said collector electrodes; and
means for emitting electrons toward and onto the opposite side of said dielectric layer for establishing said charge pattern on said dielectric layer and for directing low velocity electrons at said opposite side for driving selected areas of said dielectric layer toward one of two stable potentials to retain said charge pattern thereon.

3,956,663
LUMINESCENT SCREEN WITH THALLIUM ACTIVATED ALUMINATE

Judicus Marinus Pieter Jan Verstegen; Willebrordus Hubertus Martinus Maria van de Spijker, and Cornelis Wilhelmus Anthonius Schetters, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 6, 1975, Ser. No. 538,718
Claims priority, application Netherlands, Jan. 10, 1974, 7400329
Int. Cl.² C09K 11/26, 11/30; H01J 61/44
U.S. Cl. 313—486 7 Claims



1. A luminescent screen provided with a luminescent thallium-activated aluminate, characterized in that the aluminate has the hexagonal crystal structure of β-alumina and is defined by the formula $(Me^{I}_{1-x-p}Tl_{x\ Me^{II}p})(Al_{11-y}Mn_y)O_{17}$ in which Me^{I} represents at least one of the alkali metals sodium, potassium and rubidium and Me^{II} represents at least one of the alkaline earth metals calcium, strontium and barium, in which up to 50 mol % of aluminium may be replaced by gallium, and in which

$0.1 \leq x \leq 0.9$

$0 \leq y \leq 0.5$

$0 \leq p \leq 0.5$

$x+p \leq 1.0$.

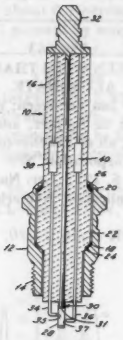
3,956,664
MULTIPLE AIR GAP SPARK PLUG

William G. Rado, and Allen H. Turner, both of Ann Arbor, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Mar. 6, 1975, Ser. No. 556,031
Int. Cl.² H01T 13/20
U.S. Cl. 315—58 7 Claims

1. In a spark generating device for igniting a lean charge, the device having a pair of primary electrodes adapted for electrical communication to a source of sparking energy and maintained in insulated spaced apart relation by insulator means to define a longitudinally extending principal spark gap, the improvement comprising:
at least one secondary electrode member extending from the insulator means and positioned adjacent to, but not obstructing, the principal spark gap;

said at least one secondary electrode member having a sparking surface defining a lateral boundary of the principal spark gap; and



means for electrically coupling said at least one secondary electrode member through an electrical high impedance to a stable voltage source.

3,956,665

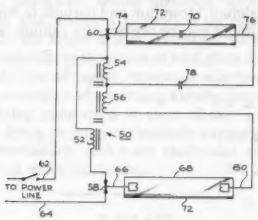
DEVICE FOR REPLACING A FLUORESCENT LAMP IN A SERIALLY CONNECTED FLUORESCENT LAMP SYSTEM

James A. Westphal, Altadena, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Continuation-in-part of Ser. No. 496,067, Aug. 9, 1974, abandoned. This application Apr. 11, 1975, Ser. No. 567,285

Int. Cl.² H05B *41/16*, *41/46*; H01G *1/02*

U.S. Cl. 315—95 **13 Claims**



1. In a fixture of the type wherein two fluorescent lamps inserted in sockets are connected in series and wherein it becomes necessary to remove one of said lamps from its socket,

means for replacing said removed lamp and minimizing power factor deterioration of said fixture and remaining lamp as well as lumen output from the remaining one of said lamps, comprising

capacitor means, inserted in the socket in place of said removed one of said lamps, having a predetermined value for preventing excessive loss of the power factor by said fixture and loss of lumen output by said remaining lamp, whereby as long as said capacitor means is connected in said socket no lamp can be inserted therein.

3,956,666

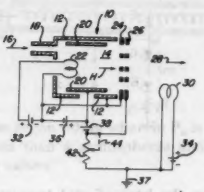
ELECTRON-BOMBARDMENT ION SOURCES

Paul D. Reader, and Harold R. Kaufman, both of Fort Collins, Colo., assignors to Ion Tech, Inc., Fort Collins, Colo.

Filed Jan. 27, 1975, Ser. No. 544,240

Int. Cl.² F03H *5/00*; H05H *1/00*

U.S. Cl. 315—111.8 **14 Claims**



11. An electron-bombardment ion source comprising:

means defining a chamber for containing an ionizable propellant;

means for introducing said propellant within said chamber;

an anode disposed within said chamber;

an electron-emissive cathode disposed within said chamber;

means for impressing a potential between said cathode and said anode to effect electron emission at a sufficient velocity to ionize said propellant;

an apertured grid disposed in the vicinity of one end of said chamber;

power source means for impressing a potential between said grid and both said cathode and said anode for accelerating ions out of said chamber through said grid;

neutralization means, located beyond said grid from said chamber, for neutralizing the electric space charge in ions flowing beyond said grid;

and a resistor connected between said grid and said neutralizing means for maintaining said neutralizing means at a positive potential relative to the potential on said grid.

3,956,667

LUMINOUS DISCHARGE DISPLAY DEVICE

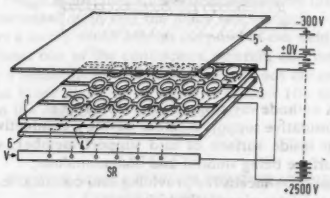
Werner Veith, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 14, 1975, Ser. No. 558,495

Claims priority, application Germany, Mar. 18, 1974, 2412869

Int. Cl.² H04N *3/16*; H05B *37/00*

U.S. Cl. 315—169 TV **19 Claims**



1. A luminous discharge device comprising: a gas-filled, gas tight envelope; a cathode positioned at one side of the envelope; a luminescent screen electrode positioned at an opposite side of the envelope; an insulating plate being regularly perforated and being spaced intermediate of said cathode and said screen electrode, a series of rows of anodes being disposed on said plate in alignment with said perforations, a series of columns of control electrodes being disposed on the other side of said plate in alignment with said perforations and being at a substantial angle to said rows of anodes; the anodes each being spaced a distance from said cathode sufficient to induce a normal gas discharge therebetween, and the control elec-

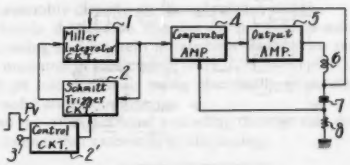
trodes each having a distance from said screen electrode too short to allow a normal gas discharge therebetween, means for applying a relatively low voltage between said cathode and said anodes on the insulating plate to develop a gas discharge therebetween, means for developing on the other side of the insulating plate, a relatively high voltage between said control-electrodes and said luminescent screen electrode, said relatively high voltage being lower than the value required to produce a gas discharge between said control electrode of the insulating plate and said screen electrode, means for selectively triggering a gas discharge adjacent said rows of anodes, and means for selectively applying a positive potential to said control electrode columns for forming an image on said luminescent screen by extraction of electrons through said perforations in said insulating plate.

3,956,668

VERTICAL DEFLECTION CIRCUIT

Yoshiaki Ogawara, Inagi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 17, 1974, Ser. No. 533,550
Claims priority, application Japan, Dec. 27, 1973, 49-4187
Int. Cl.² H01J 29/70
U.S. Cl. 315—370 **4 Claims**



1. A vertical deflection circuit comprising:
A. a Miller integrator circuit including an amplifier having input and output terminals, and a capacitor connected between the input and output terminals of the amplifier;
B. charging means connected to the capacitor of said Miller integrator circuit;
C. discharging means connected to the capacitor of said Miller integrator circuit;
D. a Schmitt trigger circuit having input and output terminals;
E. means for connecting the output terminal of said Miller integrator circuit to the input terminal of said Schmitt trigger circuit;
F. means for connecting the output terminal of said Schmitt trigger circuit to said discharging means;
G. control means connected to said Schmitt trigger circuit for supplying a vertical pulse signal thereto;
H. a vertical deflection coil; and
I. means for applying a signal obtained at the output terminal of said Miller integrator circuit to said vertical deflection coil.

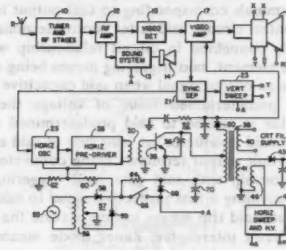
3,956,669

STANDBY POWER SUPPLY

Robert R. Del Ciello, Elmwood Park, Ill., assignor to Quasar Electronics Corporation, Franklin Park, Ill.

Filed Oct. 29, 1974, Ser. No. 518,453
Int. Cl.² H01J 29/70
U.S. Cl. 315—411 **14 Claims**

1. In a wave signal receiver having a plurality of different sections for providing different circuit functions including at least one section for supplying power to other sections of said receiver, a system for providing reduced standby power to such other sections of said receiver when said receiver is turned off including in combination:
oscillator circuit means in said one section for producing a substantially squarewave output signal at a predetermined frequency;
driver switch means having an input coupled with the output of said oscillator circuit means for switching between first and second states in response to alternate half cycles of said oscillator circuit means output signals;
transformer means having a primary winding and at least one secondary winding;
means coupling the output of said driver switch means with the primary winding of said transformer means for controlling the current flow therethrough in response to operation of said driver switch means between said first and second states of operation;



means for supplying direct current operating potential; and
an on/off switching circuit comprising a first resistor coupled between said means for supplying direct current operating potential and at least one of said oscillator circuit means and the primary winding of said transformer means, and a shunting switch means coupled in parallel with said first resistor, so that closure of said shunting switch means effectively places said on/off switching circuit in its "on" state and operates to shunt said resistor, causing a first predetermined operating potential to be supplied thereby with said shunting switch means closed and for causing a second lower predetermined operating potential to be supplied thereby with said shunting switch means being open.

3,956,670

CIRCUIT INTERRUPTER CIRCUIT INCLUDING IMPROVED CONTROL

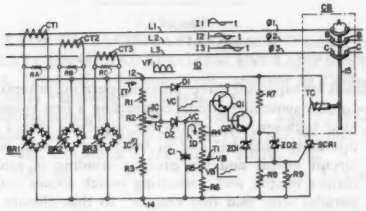
Alan B. Shimp, Monroeville, and Alfred E. Maier, Beaver Falls, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 327,965, Jan. 30, 1973, abandoned. This application May 24, 1974, Ser. No. 473,111
Int. Cl.² H02H 3/08
U.S. Cl. 317—36 TD **2 Claims**

1. A circuit interrupter including a trip means, said circuit interrupter protecting an electrical power system which includes an electrical conductor connected to the separable contacts of said interrupter, said protection being in response to the presence of a measured predetermined level of current in said electrical conductor, comprising:
a gated auxiliary means connected to said trip means to actuate said trip means in response to a protective signal being applied to the gate of said gated auxiliary means;

a sensor means disposed in arrangement with said conductor and including sensor means output terminals, said sensor means measuring the level of said current in said conductor and thereby providing a sensor output signal at said sensor means output terminals which is related to said current; and

an electrical control circuit for actuating the opening of said circuit interrupter, said control circuit having input terminals and output terminals, said input terminals being connected to said sensor means output terminals, said control circuit including a capacitive element and a resistive means connected in circuit relationship with each other between said input terminals of said control circuit, said capacitive element being charged through said resistive means by said sensor output signal to thereby develop a voltage across said capacitive element, triggering means having control terminals and output terminals, said latter output terminals corresponding to said output terminals of said control circuit, said latter control terminals being electrically connected in circuit relationship with said capacitive element, said triggering means being actuated to provide an output signal when said capacitive element attains a predetermined value of voltage thereacross which value is related to said predetermined value of current in said conductor, at least one of said electrical control circuit output terminals being connected in circuit relationship with said gate, said triggering means thereby providing a first protective signal to said gate to thus actuate said trip means to thus actuate the opening of said circuit interrupter, Zener diode means having



input terminals and output terminals, said input terminals thereof being connected directly to said sensor means output terminals, said output terminals of said Zener diode means being connected in parallel circuit relationship with said output terminals of said control circuit, said Zener diode means comprising a passive element voltage divider having an input terminal a voltage divider terminal and a common terminal, said Zener diode means additionally comprising a Zener diode having a regulating terminal and an anode, said input terminals of said Zener diode means comprising said input terminal of said voltage divider and said common terminal of said voltage divider, said output terminals of said Zener diode means comprising said anode of said Zener diode and said common terminal of said voltage divider, said regulating terminal of said Zener diode being connected to said voltage divider terminal of said voltage divider, said Zener diode means being turned on generally instantaneously by said sensor output signal to provide a second protective signal directly to said gate to thereby actuate said gate terminal to thereby energize said trip means when the voltage at said voltage divider terminal of said voltage divider is at a predetermined value equal to or greater than the Zener diode regulating voltage, said voltage between said voltage divider terminal and said common terminal being related to said sensor output signal and causing said voltage at said voltage divider terminal to reach said latter predetermined value when said current in said conductor is significantly higher in absolute value than said predetermined value of current in said conductor.

3,956,671

PROTECTION DEVICE FOR OBJECTS INCLUDED IN ELECTRICAL POWER SUPPLY NETWORKS

Gunnar Nimmersjo, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

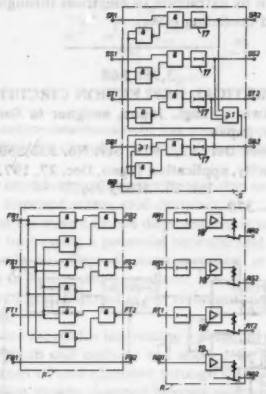
Filed Aug. 1, 1974, Ser. No. 493,915

Claims priority, application Sweden, Aug. 22, 1973, 7311395

The portion of the term of this patent subsequent to Apr. 15, 1992, has been disclaimed.

Int. Cl.[2] H02H 3/38

U.S. Cl. 317—43 6 Claims



1. Protection device for elements of electrical networks, comprising for each object at least one directional wave detector means, means connecting each of said directional wave detector means to the network, filter means (11) in said connecting means for filtering out the components of the input signals which have the same frequency as the network, each wave detector means comprising at least one wave detector unit per phase for sensing current and voltage transients occurring in the object in case of faults in the network, each wave detector unit (WD) including directional detector means and having at least one output for tripping signals and at least one output for blocking signals connected to said directional detector means included in the wave detector, a plurality of level detectors, said signal outputs each being connected to one of said level detectors, a logic system for the protection of the object, in which one directional wave detector (WD) is arranged for each connection to the object which is to be protected and connected through the level detectors to the logic system, said logic system including means to compare the output signals from the directional wave detectors for the object and to disconnect the object in response to a tripping signal from any of said directional wave detectors only when none of the wave detectors has emitted a blocking signal.

3,956,672

IN LINE RECTIFIER ASSEMBLY

Christ J. Dumas, Forest View, Ill., assignor to American Plasticraft Company, Chicago, Ill.

Continuation of Ser. No. 450,598, March 13, 1974, abandoned. This application Aug. 1, 1975, Ser. No. 601,211

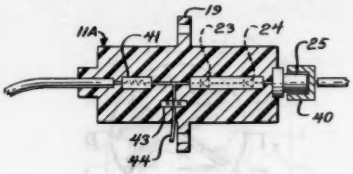
Int. Cl.[2] H01L 23/02

U.S. Cl. 317—99 1 Claim

1. A high voltage rectifier assembly comprising, in combination,

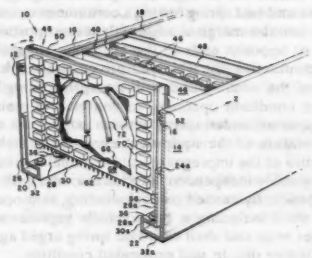
an elongated cup-like casing of dielectric material, said casing having an open end and a covered end, the covered end having a hole,

encapsulating compound in said casing,
solid state components positioned in spaced linear relation substantially along the longitudinally axis of said casing,
an electrical lead extending through said hole and electrically coupling to said components,
an electrical cap terminal positioned adjacent the open end of said casing and electrically coupling to said components for enabling a snap over electrical connection to be made to said assembly,
said encapsulating compound retaining said lead, said components and said terminal in said casing, and



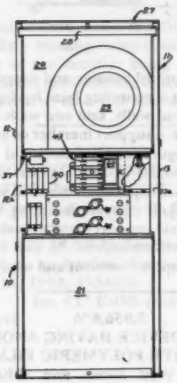
a mounting flange substantially encircling said casing transverse to the axis of the casing for mounting said rectifier assembly directly on the associated chassis,
wherein there is an opening on the side of said cup-like casing and wherein a capacitor having two terminals is mounted in said casing;
on of said terminals being electrically connected to said solid state components,
and the other terminal extending through said opening for connection externally of the casing.

3,956,673
PRINTED CIRCUIT MODULES COOLED BY RACK WITH FORCED AIR
Gordon Seid, Los Angeles, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.
Filed Feb. 14, 1974, Ser. No. 442,664
Int. Cl.² H05K 7/20
U.S. Cl. 317—100 **4 Claims**



1. An air-cooled circuit card module comprising at least one planar circuit card having a first surface for carrying circuit components thereon and a second surface on the opposite side of said card and lying in a plane parallel with respect to the plane of said first surface; said module defining an enclosed space and having one interior wall thereof substantially defined by said second surface of said circuit card; a rack having first and second sides; means mounting said module in said rack and extending from side-to-side across said rack; air passage means formed in each side of said rack; and a hollow air pin having a first end connected to said module and extending through a wall thereof and having a second end extending into said air passage means in said rack for supplying air from one side of said rack into said enclosed space; and means for returning said air from the other side of said enclosed space to the other side of said rack whereby heat is transferred away from said second surface of said circuit card.

3,956,674
ELECTRIC FURNACE WITH INTERLOCKING DISCONNECT PANEL FOR ELECTRIC BOX
Ray Scott Farley, Wichita, Kans., assignor to The Coleman Company, Inc., Wichita, Kans.
Filed Oct. 11, 1974, Ser. No. 513,953
Int. Cl.² H02B 1/10
U.S. Cl. 317—114 **6 Claims**



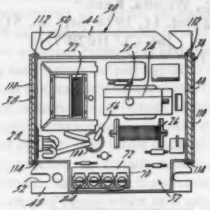
1. In combination with an electric heating appliance having enclosing side walls, means housing electric heater coils, and blower means receiving room air for forcing the same over said coils, the improvement comprising: means integral with said appliance forming an electric box therein having a top wall, bottom wall, rear wall and first and second side walls, and defining an access aperture; a main disconnect switch including a base portion secured within said electric box and having at least one pair of spaced apart electrical contacts, and a plug removably assembled to said base and including a body portion and connecting means coupling said pair of contacts together when said plug is assembled to said base, said body portion including an inner section of reduced cross sectional area carrying said connecting means and an outer section of larger cross sectional area to define shoulder means spaced from said base in said assembled relation, said body portion further providing grip means on said outer section to facilitate removal of said plug; fuse holder means mounted on said base member of said disconnect assembly; and a removable cover panel covering said access aperture to close said electric box and defining an aperture slidably receiving said inner section of said plug and preventing insertion of said outer section, whereby said cover panel extends between said shoulder means of said removable plug and said base member when in assembled relation and said cover panel cannot be removed without first removing said plug and thereby disconnecting said switch.

3,956,675

ELECTRICAL CONTROL HOUSING AND SUPPORT PACKAGE

Frederick T. Bauer, and Anthony C. Cairo, both of Holland, Mich., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Oct. 15, 1974, Ser. No. 514,441
Int. Cl.² H05K 5/04
U.S. Cl. 317—120 2 Claims



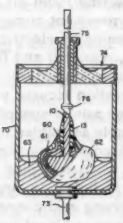
1. In an electrical control housing and support package, the combination including a mounting base having a bottom wall and spaced, integral end walls, said end walls each defining a pair of spaced notches, a support member of generally rectangular prismatic configuration, an electrical control circuit carried by and embedded in said support member, means floatingly mounting said support member on said base including a plurality of integral tapered mounting lugs disposed at the opposite ends of said support member, said mounting lugs projecting into the notches defined by said end walls, and a cover overlying said support member and secured to said base.

3,956,676

ELECTRICAL DEVICE HAVING ANODE RISER ASSEMBLY WITH POLYMERIC FILM MEANS

William F. Vierow, West Acton, and Milton Kallianides, Brockton, both of Mass., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Continuation of Ser. No. 412,299, Nov. 2, 1973, which is a continuation of Ser. No. 307,651, Nov. 17, 1972, abandoned.
This application Jan. 17, 1975, Ser. No. 541,839
Int. Cl.² H01G 9/00, 9/16; H01L 23/28
U.S. Cl. 317—230 12 Claims



1. A device comprising electrolyte means, anode means capable of performing an electrical function contacted by the electrolyte means, and an anode riser assembly of film-forming metal including an elongated wire-like portion with a surface contour and an integral headed portion formed from the elongated wire-like portion and contacted by the anode means, and polymeric film means substantially adhered to and conforming to the contour of the surface of the elongated wire-like portion of the anode riser assembly to provide an interface therebetween into which is minimized the ingression of electrolyte means, the polymeric film means extending substantially to the headed portion of the anode riser assembly.

3,956,677

IGNITION TYPE CAPACITOR

Kenneth L. Quick, Oglesby, Ill., assignor to Electrical Utilities Company, LaSalle, Ill.

Continuation of Ser. No. 346,777, April 2, 1973, abandoned.
This application Dec. 17, 1974, Ser. No. 533,488
Int. Cl.² H01G 1/14
U.S. Cl. 317—260 6 Claims

1. A high temperature operating capacitor where the components are pre-seated comprising:

a cup-shaped shell including a sidewall, an embossed bottom wall at one end, and an open other end;

an electrically insulating tube within said shell having first and second ends, said first end contacting said bottom wall;

a capacitor winding disposed within said tube and including first and second exposed metallic layers at opposite ends of said winding and having a dielectric comprising a solid wax impregnant, said first layers contacting said bottom wall;

a perforated conductive disc independently carried on and electrically contacting said second metallic layers; and

a terminal assembly including an electrically insulating washer carried within said shell and at said second end of said tube, an electrical lead extending through said washer, and an arcuate-shaped disc-like spring electrically connected to said lead and bearing against said washer and said spring having a continuous uninterrupted outer annular marginal edge with at least portions of the edge at opposite ends of the arc being engaged against said conductive disc which in turn engages each counterturn of the winding and with the spring being in a pre-seated condition operating to continue to maintain the components under spring tension where the operating temperature of the equipment exceeds the melting temperature of the impregnant, said terminal assembly being an assembly independent of said disc and with said disc independently carried on said winding, said open end of said shell including a bead which together with said washer seals said shell with said spring urged against said conductive disc in said pre-seated condition.

3,956,678

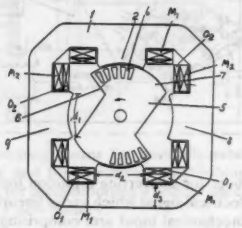
ELECTRODYNAMIC SYSTEM COMPRISING A VARIABLE RELUCTANCE MACHINE

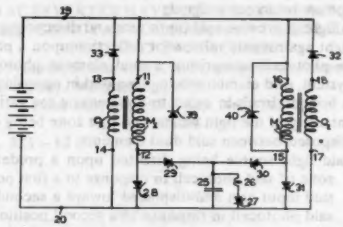
John Byrne, Dalkey, and James C. Lacy, Dublin, both of Ireland, assignors to John Byrne and James G. Lacy, both of Dublin, Ireland

Continuation of Ser. No. 230,720, March 1, 1972, which is a continuation-in-part of Ser. No. 49,619, June 25, 1970, abandoned. This application Aug. 7, 1973, Ser. No. 386,347
Int. Cl.² H02K 1/06, 29/04
U.S. Cl. 318—138 8 Claims

1. A process for controlling current in a variable-reluctance machine comprising the following steps in cyclic order:

a. coupling a source of electrical energy across the main field winding of the machine until the current therein reaches a predetermined value
b. decoupling the source of electrical energy from the main field winding when the current reaches a predetermined value
c. transferring the ampere-turns of the main winding to an auxiliary winding closely coupled therewith, without discontinuity
d. coupling the auxiliary winding to the source of electrical energy in the sense to direct current back to the source
e. free-wheeling the current in the auxiliary winding back to the source by the voltage generated by decay of flux





linking said auxiliary winding until the current falls to a predetermined value, this being a fixed percentage of the predetermined maximum value of the current in the main winding
f. transferring to and reinforcing the current in the main winding by again coupling the main winding to the power source
g. again decoupling the source of electrical energy from the main winding when the current reaches a predetermined value
h. returning current to the source under the induced voltage generated in the coupled auxiliary winding by the decay of flux linking said auxiliary winding until the current is zero.

3,956,679

BRUSHLESS A.C. SYNCHRONOUS MOTORS

Brian John Chalmers, Bramhall, England, assignor to C.A.V. Limited, Birmingham, England

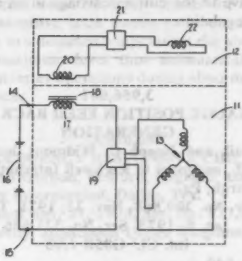
Filed Dec. 17, 1974, Ser. No. 533,618

Claims priority, application United Kingdom, Dec. 22, 1973, 59676/73

Int. Cl.² H02P *1/46*

U.S. Cl. 318—171 **4 Claims**

1. A brushless AC synchronous motor for operation from a DC supply comprising in combination a stator assembly, a stator winding forming part of the stator assembly, a rotor assembly, a field winding forming part of the rotor assembly, a transformer having a primary winding on the stator assembly and a secondary winding on the rotor assembly, an inverter for supplying alternating current to said stator winding, the primary winding of the transformer being connected in a circuit with the inverter and a pair of DC supply terminals whereby the current flow in the primary winding of the transformer will



be of a fluctuating nature, and a rectifier on the rotor assembly, said secondary winding being connected to the rectifier and the output of the rectifier being supplied to the field winding whereby the field winding is excited in use independantly of the rotation of the rotor assembly.

3,956,680

ELECTRIC COPYING CONTROL DEVICE FOR CHIP REMOVING MACHINE TOOLS

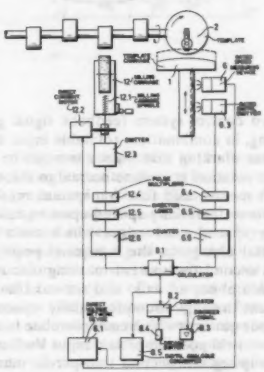
Kurt Maecker, Georg-Kalb-Strasse 19, 8021 Gross-Hesselohe, Germany

Filed July 26, 1973, Ser. No. 382,902

Claims priority, application Germany, July 28, 1972, 2237060; May 17, 1973, 2324886

Int. Cl.² G05B *19/36*

U.S. Cl. 318—578 **9 Claims**



1. An electric copying control device in a completely separate unit for crankshaft cutting machines including a cutting carriage working with a coordinate relative to a workpiece spindle and with which a template carriage follows a template driven by way of a workpiece spindle motor, whereby the template carriage drives means for regulation of speed of feed drive and additionally means are provided for control of position of the cutting carriage relative to the template carriage, the improvement of combination therewith which comprises: electrical synchronizing means provided to assure non-mechanical interconnection between the template and the workpiece spindle on one hand and the template carriage and

cutting carriage on the other hand to assure exact synchronization thereof relative to each other, and a single electrical measuring means providing electrical signals therewith utilized to represent on one hand a rated value for speed regulation of drive for copying feed of the cutting carriage and on the other hand serving to control position of the template carriage relative to the cutting carriage in an electrical position control regulation.

3,956,681

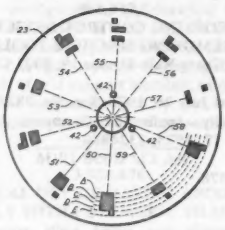
BACK GAUGE POSITION FEED BACK SIGNAL GENERATION

Robert W. Vail, and Joseph C. Widmont, both of Newport Beach, Calif., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Division of Ser. No. 200,868, Nov. 22, 1971. This application Jan. 8, 1973, Ser. No. 321,626

Int. Cl.² G05B 1/06

U.S. Cl. 318—640 **3 Claims**



1. Servo control system feedback signal generator means comprising, in combination: rotatable input shaft means, first transparent marking disc means secured to said input shaft means for rotation in a plane normal to the rotational axis of said shaft means, said first transparent marking disc means having circumferentially spaced-apart opaque markings with uniformly spaced-apart edges which each correlate to an incremental change in the rotational position of said shaft means; a second transparent marking disc means supported for rotation about an axis, said second transparent marking disc means having circumferentially spaced-apart opaque binary-code patterns which each correlate to a different multiple turn control position of said input shaft means, gear train means coupling said second transparent marking disc means in driven and reduced rate of rotation relation relative to said first transparent marking disc means, lamp means positioned in cooperating relation to said first and second transparent marking disc means and to said opaque markings and patterns, and a pair of photoelectric light detector device arrays positioned in cooperating relation to said first and second transparent marking disc means and said opaque markings and patterns and in illuminated relation relative to said lamp means, one of said arrays producing binary-code signals correlated to different multiple turn control positions of said input shaft means, and the other of said arrays producing pulsed signals correlated to incremental changes in the positions of said input shaft means in intervals intermediate adjacent of said input shaft means multiple turn control positions.

3,956,682

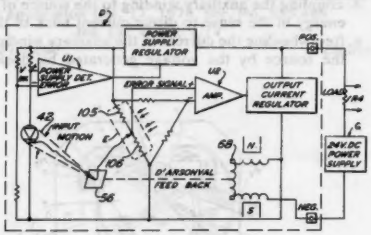
TWO-WIRE POSITION-TO-D.C. CURRENT TRANSDUCER

Donald Edwin Van Dyck, Chatham, N.J., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Mar. 28, 1974, Ser. No. 455,685

Int. Cl.² G05B 1/06

U.S. Cl. 318—640 **11 Claims**



1. A transducer for converting a motion input into a D.C. milliampere electrical signal which varies linearly with angular rotation of a mechanical input arm comprising:

a. a mirror hingedly supported about a predetermined axis including motor means for rotating said mirror in response to an error signal;

b. a light source on said input arm and directing a beam of light against said mirror for reflection upon a photocell;

c. a photocell comprising a dual element photosensitive system, said elements being disposed in opposing arms of a bridge circuit in order to compensate for variations in intensity of the light beam, said first zone being centrally disposed between said dual elements;

said light source being directed upon a predetermined zone of said photocell in response to a first position of said input arm and displaced toward a second zone of said photocell in response to a second position of said input arm;

said photocell delivering an error signal when the light beam is displaced from said first to said second zone thereof;

d. servo means responsive to the error signal and actuating said motor means until the mirror is rotated in a direction that swings the light beam toward the first zone of said photocell to cancel said error signal; and

e. electronic means delivering an output current signal, proportional to the error signal from said photocell.

3,956,683

TAPER TYPE OF BATTERY CHARGER

Ralph Popp, Pittsburgh, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

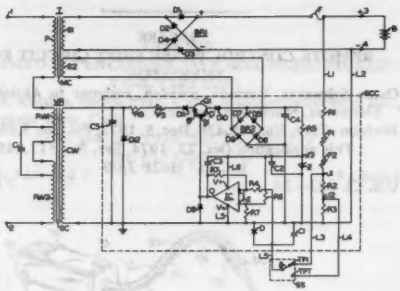
Filed Mar. 6, 1974, Ser. No. 448,459

Int. Cl.² H02J 7/10

U.S. Cl. 320—23 **8 Claims**

1. An automatic taper charging battery charger comprising, a pair of input terminals for connection to a source of a.c. voltage, a transformer having a primary and a pair of secondary windings, a d.c. controlled variable reactor having controlled and control windings, said primary and controlled windings connected in series to said pair of input terminals, a first rectifier coupled to one of said pair of secondary windings and a second rectifier coupled to the other of said pair of secondary windings, a pair of output terminals connected to said first rectifier, and a control circuit connected to said second rectifier, said control circuit having a voltage sensing network coupled to said output terminals and having an output circuit coupled to said control winding for controlling the impedance of said d.c. controlled variable reactor, said control circuit including a linear operational amplifier for control-

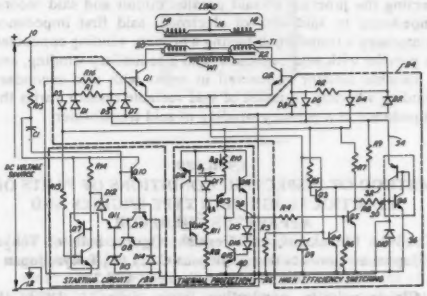
ling the current in said output circuit by proportionally varying the impedance of a semiconductive impedance device in accordance with the voltage appearing on said output terminals, and switching means for normally establishing a float charging rate and for selectively establishing an equalizing charging rate for reconditioning a seldom used battery and for conditioning a new battery.



3,956,684
DC TO AC INVERTER HAVING IMPROVED SWITCHING EFFICIENCY, OVERLOAD, AND THERMAL PROTECTION FEATURES

John P. Walden, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 21, 1974, Ser. No. 516,773
Int. Cl.[2] H02M 7/515
U.S. Cl. 321—12 26 Claims



20. An electrical inverter circuit for converting a DC electrical input into an AC electrical output, said inverter circuit comprising:

a transformer structure having secondary winding means for supplying said electrical output, a primary winding means and a tertiary winding means, all said winding means being magnetically coupled to each other through magnetic circuit means;

active element switch means electrically connected to said primary winding means and to said tertiary winding means and electrically connectable to said DC electrical input for alternately switching said DC electrical input to said primary winding for producing corresponding varying magnetic fields in said magnetic circuit means and thereby producing said AC electrical output in said secondary winding means,

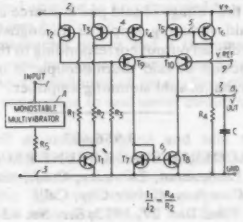
electrical control means electrically connected to said active element switch means for monitoring the magnitude of electrical current flowing in said primary winding means and for controlling said alternate switching operation in response to the detection of current in said primary winding means in excess of a predetermined level, said electrical control means including current sensitive latch means which is triggered to a conductive state by the detection of said predetermined level of current, and

thermal protection circuit means electrically connected to said current sensitive latch means for triggering said current sensitive latch means to its conductive state in response to a detected temperature rise above a predetermined maximum level thus automatically terminating normal inverter operations during abnormal temperature occurrences.

3,956,685
FREQUENCY RESPONSIVE CIRCUIT

James Sneddon Gordon, Bedford, England, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 27, 1974, Ser. No. 527,553
Claims priority, application United Kingdom, Dec. 3, 1973, 56011/73
Int. Cl.[2] H02M 5/22
U.S. Cl. 321—60 8 Claims



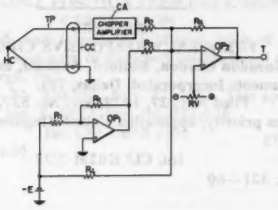
1. A circuit arrangement responsive to the frequency of an input signal, including capacitor means for storing a voltage not exceeding a predetermined value; first and second current source means for generating first and second steady currents respectively; transistor switching means operably responsive to a variable frequency input signal operably to connect said first current source means to said capacitor means for a fixed first time interval in each cycle of said input signal to change the voltage stored by said capacitor means in a first sense, and for enabling said second current source means operably to connect said second current to said capacitor means for a second time interval in each said cycle dependent on the frequency of said input signal to change the voltage stored by said capacitor means in an opposite sense, such that said capacitor means stores a residual voltage of said one sense when the frequency of said input signal traverses a threshold value, said residual voltage having a value dependent on said input signal frequency; and wherein each of said current source means includes first and second like conductivity type transistors, said first transistor having an emitter connected to a first supply conductor and a collector connected by a path including a resistor to a second supply conductor, said second transistor having an emitter connected to said first supply conductor and a base connected to the base of said first transistor such that a current determined by said resistor tends to flow through the collector of said second transistor.

3,956,686

COMPENSATING CIRCUIT FOR A COLD JUNCTION OF A THERMOCOUPLE

Katsuaki Tanaka, Tokyo, Japan, assignor to Iwatsu Electric Co., Ltd., Tokyo, Japan

Filed Sept. 20, 1974, Ser. No. 507,855
Claims priority, application Japan, Sept. 29, 1973, 48-110034
Int. Cl.² G01K 5/72, 7/12
U.S. Cl. 322—2 R 5 Claims



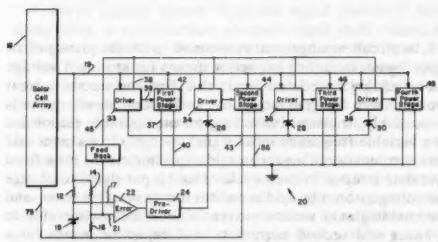
1. A compensating circuit for a cold junction of a thermocouple, comprising a power source, a sign inverting DC amplifier having one input thereof connected to said power source, a heat-sensing resistor connected in a feedback path of said sign inverting amplifier and a summing amplifier having an input connected to the output of said sign inverting DC amplifier, a thermoelectromotive force generated from a thermocouple and the voltage of said power source are applied to said input of said summing amplifier through resistors, respectively, whereby an output corresponding to the temperature of the hot junction of said thermocouple is obtained from an output terminal of said summing amplifier.

3,956,687

STAGGERED STAGE SHUNT REGULATOR

Gerald A. Lindenman, Torrance, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 27, 1973, Ser. No. 432,261
Int. Cl.² G05F 1/60
U.S. Cl. 323—8 7 Claims



1. Apparatus for regulating a source of current and significantly reducing power dissipation in said apparatus comprising:

a source of current comprising solar cells;

a plurality of power stages connected between said source of current and ground for shunting excess current; and

a plurality of switching means connected to said power stages for activating said stages in sequence such that substantially when one power stage is saturated, the next stage is activated, until all of said power stages have been activated and then saturated in sequence;

said power stage comprises a plurality of power transistors with their bases connected together and their collectors connected to said current source and their emitters connected to ground;

said switching means comprise a plurality of different valued zener diodes for sequentially shunting excess current to ground.

3,956,688

REMOTE CONTROL PHASE SHIFT CIRCUIT FOR THYRISTOR

Osten Schwartz, Varmdo, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Division of Ser. No. 315,438, Dec. 5, 1972, Pat. No. 3,855,665.
This application Oct. 23, 1974, Ser. No. 517,045
Int. Cl.² H02P 3/00
U.S. Cl. 323—24 7 Claims

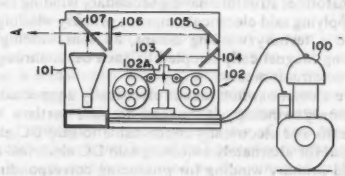
1. A remote control system for a device having a motor and input terminals adapted to be connected to a source of AC electrical energy; comprising a thyristor, said thyristor having a control electrode, means connecting said motor to said terminals by way of said thyristor for energizing said motor, a phase shifting network comprising a parallel circuit of a capacitor and a first impedance, and second impedance connected in series with said parallel circuit, means connecting said network in parallel with said thyristor, and means connecting the junction of said parallel circuit and said second impedance to said control electrode, said first impedance comprising a transformer having a primary winding connected in parallel with said capacitor, and a secondary winding, and a variable resistor connected in series with said secondary winding whereby variation of said variable resistor varies the impedance at a primary winding of said transformer.

3,956,689

METHOD OF INSPECTING CONDITIONS OF PARTS OF ELECTRICAL IGNITION TYPE ENGINES AND APPARATUS THEREFOR

Kunihiko Murakami, and Toshiaki Ogura, both of Tokyo, Japan, assignors to Banzai Jidosha Co., Ltd., Tokyo, Japan

Filed July 15, 1974, Ser. No. 488,785
Claims priority, application Japan, July 21, 1973, 48-82344; May 24, 1974, 49-59163; May 24, 1974, 49-60185
Int. Cl.² F02P 17/00
U.S. Cl. 324—16 S 9 Claims



1. A method of inspecting conditions of parts of electrical ignition-type engines comprising the steps of: pre-recording standard electrical waveforms representative of normal and abnormal conditions of parts of an electrical ignition type engine to be inspected; and dynamically displaying an actual

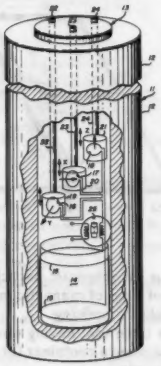
electrical waveform indicative of the condition of a part of the engine under operation simultaneously with display of the corresponding one of the pre-recorded standard waveforms thereby facilitating visual comparison of them.

3,956,690

TRIMMED SUPERCONDUCTIVE MAGNETIC PICKUP COIL CIRCUITS

Louis H. Rorden, Menlo Park, Calif., assignor to Develco, Inc., Mountain View, Calif.

Filed Jan. 21, 1974, Ser. No. 435,112
Int. Cl.² G05F 7/00
U.S. Cl. 323—44 F **9 Claims**



1. In a superconductive magnetic sensor:

superconductive primary pickup coil circuit means for sensing a component of magnetic field or gradient of a magnetic field in which said primary pickup coil circuit means is disposed by picking up a magnetic flux proportional to the sensed magnetic field or magnetic field gradient component;

an auxiliary superconductive trim coil circuit means disposed in said magnetic field common to said pickup coil circuit means for picking up a magnetic flux from said common magnetic field;

sensor means electromagnetically coupled to said primary pickup coil circuit means and to said trim coil circuit means for combining magnetic flux picked up by both said primary pickup coil circuit means and said trim coil circuit means to derive an output proportional to the combined magnetic flux picked up by said primary pickup coil circuit means and by said trim coil circuit means; and

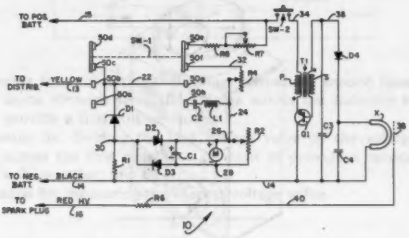
means for varying the coupling of said auxiliary trim coil circuit means to the magnetic field in which it is disposed and while said auxiliary trim coil circuit is in a superconducting state to effect a change in the trim magnetic flux component coupled into said sensor means while said auxiliary trim coil circuit is in a superconducting state.

3,956,691

MULTIPLE FUNCTION TESTING DEVICE FOR SIMULTANEOUS TESTING OF FUNCTIONS OF AN ENGINE

Dmytro Hryhorczuk, Chicago, Ill., assignor to Orbit Laboratories, Inc., Chicago, Ill.

Continuation of Ser. No. 437,248, Jan. 28, 1974, abandoned. This application Mar. 27, 1975, Ser. No. 562,863
Int. Cl.² F02P 17/00
U.S. Cl. 324—15 **15 Claims**



1. An apparatus for testing an internal combustion engine by measuring distributor timing, cam dwell revolutions per minute and voltage functions, said apparatus including in combination:

a single meter circuit including an input terminal and an output terminal adapted to be connected to a first terminal of the engine battery;

a cam dwell measuring means and a tachometer means, both said means having a common input terminal for connection to a distributor of an engine and an output terminal for connection to said meter circuit input terminal;

said cam dwell measuring means and said tachometer means being connected within said apparatus to operate supstantially independently of each other;

an engine timing light means having a first terminal for connection to a second terminal of said battery, a second terminal for connection to a spark plug, and a third terminal for connection to said meter circuit output terminal;

and a voltmeter means including a variable resistor having a resistance range selected to provide full scale meter deflection for the condition of a battery being charged to its maximum potential coupled between said timing light means first terminal and said meter circuit input terminal, one of said cam dwell measuring means, said tachometer means and said voltmeter means being selectively operable simultaneous with operation of said timing light means for simultaneous measurement of engine timing and one of cam dwell, revolutions per minute and voltage.

3,956,692

METAL OBJECT COMPARATOR UTILIZING A RAMP HAVING A V-SHAPED SLOT FOR MOUNTING THE OBJECT ACCURATELY WITHIN THE TEST COIL

Stanley Weinberg, Los Angeles, Calif., assignor to Wein Products, Inc., Los Angeles, Calif.

Filed Dec. 23, 1974, Ser. No. 535,858
Int. Cl.² G01R 33/12; G07F 3/02
U.S. Cl. 324—34 R **5 Claims**

1. A device for determining the characteristics of a metal object to be tested by comparison with a standard metal object, comprising:

a radio frequency oscillator, said oscillator including an open wound air core sensing coil in its tuning circuit,

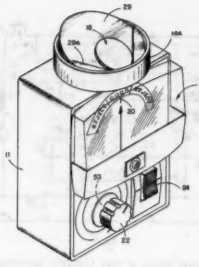
means for mounting said sensing coil to removably receive said objects in a predetermined position in proximity to the windings thereof, said mounting means comprising a

ramp mounted in the core of the sensing coil, said ramp having a "V" slot for receiving the objects,

detector means for receiving the output of said oscillator and providing a DC in accordance with said oscillator output,

amplifier means for amplifying the output of said detector means,

indicator means for receiving the output of said amplifier means, and



null circuit means for adjusting the current fed to said indicator means to provide a predetermined "null" reading thereon when said standard object is in said predetermined position in close proximity to the coil windings,

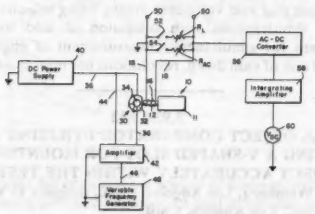
whereby when said object to be tested is placed in said predetermined position after said null circuit has been adjusted to said standard object, deviations of the indicator reading from the "null" reading are indicative of the characteristics of the object to be tested as compared with the standard object.

3,956,693

METHOD AND APPARATUS FOR TESTING MAGNETIC SENSORS USING A SATURABLE CORE AND VARIABLE LOAD RESISTORS TO SIMULATE ACTUAL TEST CONDITIONS

Stephen W. Zutrauen, Weston, and Peter P. Stauskas, Toronto, both of Canada, assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Dec. 23, 1974, Ser. No. 535,917
Int. Cl.² G01R *35/00*
U.S. Cl. 324—34 R **6 Claims**



1. Apparatus for electrically simulating a mechanical stimulus for causing the production of an electrical response by a magnetic sensor and evaluating the response, said apparatus comprising:

a magnetizable core having an excitation coil;

means for mounting a magnetic sensor adjacent to the magnetizable core;

means for applying a fluctuating voltage to the excitation coil for producing changes in the permeability of the core substantially duplicating the changes produced by a mechanical stimulus; and

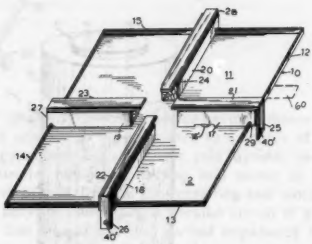
evaluation means electrically connected to the magnetic sensor for measuring the voltage from the magnetic sensor, said response evaluation means includes resistance means electrically connected to the output leads of said sensor for applying equivalent load and eddy current loss resistance to those of the mechanical stimulus being simulated.

3,956,694

TEST TABLE FOR MAGNETIC PARTICLE FLAW DETECTION

Arthur A. Jackman, R.D. No. 2, Corry, Pa. 16407

Continuation of Ser. No. 445,840, Feb. 26, 1974, abandoned, which is a continuation-in-part of Ser. No. 347,469, April 3, 1973, abandoned. This application Apr. 23, 1975, Ser. No. 570,681
Int. Cl.² G01R *33/12*
U.S. Cl. 324—38 **1 Claim**



1. An apparatus for magnetic particle inspection of structures of the type of rings of magnetic material of various sizes to determine cracks comprising

a relatively flat table top, having upwardly extending marginal edges forming a container for liquid and a drain hole positioned therein,

at least four elongated blocks made of insulating material extending from a central position radially outward beyond said marginal edge,

said elongated blocks being generally rectangular in cross section and having flat tops and flat bottoms resting on said table top substantially throughout their entire length, each said insulating block having an upwardly extending notch adjacent its outer end receiving said upwardly extending edge marginal of said table top,

at least four conductor bars made of electrically conducting material,

each said bar being generally rectangular in cross section and having a flat top and a flat bottom resting on one of said flat tops of said insulating blocks throughout substantially its entire length,

said bars extending from a central position radially outward to a position to the outer end of the said blocks on which the respective bar rests,

a downwardly extending conducting end bar generally rectangular in cross section and of equal width to the said bars fixed to each said conductor bar and extending downwardly therefrom beyond the lower edge of said table top,

a hole means in the lower ends of each said end bars for connecting an electrical conductor to said end bar,

the inner ends of said conductor bars being spaced from each other and spaced from said table top,

the top surface of said conductor bars being relatively flat and disposed in a common plane with each other whereby an object having at least one planar surface can be supported thereon in electric conducting relation thereto,

a tank positioned under said table and proximate said drain hole to collect liquid passing through said hole,

means for pumping liquid containing magnetic particles from said tank onto the test piece positioned upon said conductor bars, and

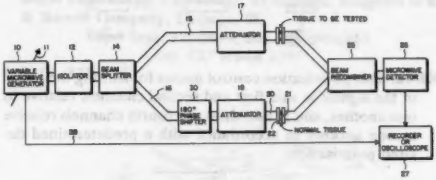
D.C. current means connected to said bars to pass current through the test piece to create a magnetic field therein, said field being distorted by flaws, whereby magnetic particles in the liquid will be attracted thereto to indicate the flaws.

3,956,695

MICROWAVE SPECTRAL IDENTIFICATION OF CELLS

Michael E. Stamm, 10965 Rochester No. 104, Los Angeles, Calif. 90024

Filed July 22, 1974, Ser. No. 490,260
Int. Cl.² G01R 27/04
U.S. Cl. 324—58.5 A **4 Claims**



1. The method of automatically determining possible malignancy in cells to be tested by microwave spectral analysis by subtracting the spectrum of normal cells from that of cells to be tested, said method comprising the steps of:

a. generating a first microwave beam;

b. generating a second microwave beam of substantially equal phase, frequency and power;

c. spreading normal cells into a thin, substantially uniform layer;

d. interposing the layer of the normal cells into the path of the first beam;

e. spreading cells to be tested into a thin, substantially uniform layer;

f. interposing the layer of cells to be tested into the path of the second beam;

g. shifting the phase of one of the beams by 180°;

h. varying the frequency of the microwave beams simultaneously over a predetermined frequency range; and

i. detecting the difference of the response of the two beams over the predetermined frequency range, whereby the spectrum of the normal cells is automatically subtracted from the spectrum of the cells to be tested over the predetermined frequency range to determine the presence of malignancy.

3,956,696

APPARATUS FOR MEASURING THE RESISTANCE OF AN INDUCTOR, HAVING TIME CONSTANT COMPENSATION

Michael G. Daniels, Muncie, Ind., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

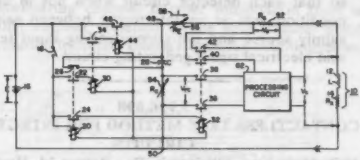
Filed Apr. 17, 1975, Ser. No. 569,037
Int. Cl.² G01R 27/02
U.S. Cl. 324—62 **12 Claims**

1. Electrical apparatus for measuring the resistance of an inductor, comprising:

a first circuit branch having at least a first resistance element connected in series with the inductor being measured;

a second circuit branch having a second resistance element and a capacitance element, said first branch being connected in parallel circuit relationship with said second branch to form a parallel network;

means for applying a voltage to the parallel network which causes current flow through the first and second resistance elements and through the inductor;



means for subtracting the voltage across the second resistance element from the voltage across the inductor to provide a first voltage value;

means for dividing the first voltage value by the voltage across the first resistance element to provide a second voltage value; and

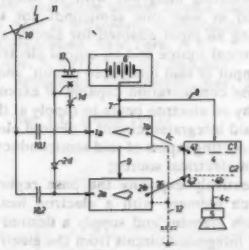
means for measuring the second voltage value.

3,956,697

VOLTAGE DETECTOR FOR DETECTING DIFFERENT VOLTAGE LEVELS IN CONDUCTORS OF AN ELECTRICAL POWER LINE

Maurice Néry, Paris, France, assignor to IPA Internationale Patent - und Lizenz-Anstalt, Liechtenstein

Continuation of Ser. No. 351,067, April 13, 1973, abandoned. This application Jan. 24, 1974, Ser. No. 436,278
Claims priority, application France, Apr. 17, 1972, 72.213393
Int. Cl.² G01R 19/16
U.S. Cl. 324—133 **11 Claims**



1. A voltage detector for detecting different voltage levels in conductors of an electrical power line and generating corresponding signals, comprising:

a. an input electrode adapted to be placed in contact with a conductor of said power line;

b. an output electrode formed by an electrically conductive mass cooperating capacitively with the ground;

c. at least two detector circuits having different voltage sensitivity thresholds;

d. an electrical signal generating circuit having an input terminal for each of said detector circuits and having an output terminal, said circuit being arranged to produce recurrent electrical signals, the duration and mutual spacing of which depend on the input terminal to which a voltage is applied;

e. a warning device for transforming said electrical signals into corresponding acoustic or optical warning signals;

f. means for electrically connecting the input terminal of each detector circuit to said input electrode and means for electrically connecting a first output terminal of each detector circuit to an input terminal of said electrical

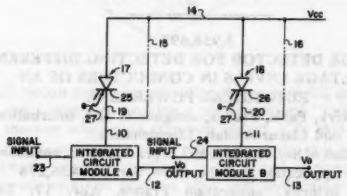
signal generating circuit and a second output terminal to said electrically conductive mass, to bring each detector circuit into conductive condition when the voltage sensitivity threshold thereof is reached; and

g. a current supply source for energising said detector circuits and electrical signal generating circuit, and arranged so that each detector circuit when not in conductive condition acts as an interrupter between said current supply source and the corresponding input terminal of said electrical signal generating circuit.

3,956,698
CONTACTLESS TEST METHOD FOR INTEGRATED CIRCUITS

Paul R. Malmberg, Pittsburgh, Pa.; Robert M. Handy, Phoenix, Ariz.; Donald F. Stoneburner, Monroeville, Pa., and David Green, Painted Post, N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 12, 1974, Ser. No. 441,924
Int. Cl.² G01R 31/26
U.S. Cl. 324—158 R **12 Claims**



1. A method of contactless testing of an integrated circuit comprising the steps of:

A. fabricating integrally with an integrated circuit to be tested at least one semiconductor switch element (i) having an input adapted for electrical connection to an electrical source and an output electrically connected to an input of said integrated circuit, and (ii) having a base region configuration capable of exposure to and switching by an electron beam to supply at the connected input to said integrated circuit a desired electrical input;

B. connecting inputs of said semiconductor switch elements to an electrical source;

C. selectively exposing the base regions of at least one switch element with a electron beam to actuate said switch element and supply a desired electrical input to said integrated circuit from the electrical source; and

D. measuring electrical responses of at least a segment of the integrated circuit to said electrical input to determine whether said circuit segment possesses specified electrical characteristics.

3,956,699
ELECTROMAGNETIC WAVE COMMUNICATION SYSTEM WITH VARIABLE POLARIZATION

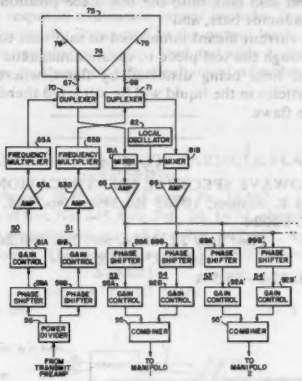
Henry C. Leahy, Severna Park, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 22, 1974, Ser. No. 490,641
Int. Cl.² H04L 5/14
U.S. Cl. 325—15 **7 Claims**

1. An electromagnetic wave system comprising:

A. at least one radiation aperture having a dual mode radiation element therein for both transmitting and receiving electromagnetic signals with mutually orthogonal polarization modes;

B. first and second electronic signal processing channels connected in signal transfer relationship therewith for conduction of signals to said element when in the transmitter mode of operation and at least third and fourth electronic signal processing channels in signal transfer relation therewith for conduction of signals from said element, in the receiver mode of operation; and

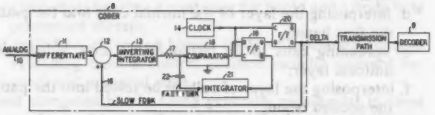


C. variable polarization control means for shifting the phase of the signals in said first and second channels relative to one another, and in said third and fourth channels relative to one another in accordance with a predetermined desired polarization.

3,956,700
TWO-FEEDBACK-PATH DELTA MODULATION SYSTEM WITH CIRCUITS FOR REDUCING PULSE WIDTH MODULATION

Joseph Henry Condon, Summit, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 18, 1975, Ser. No. 569,160
Int. Cl.² H03K 13/22
U.S. Cl. 325—38 B **19 Claims**



1. In a delta modulation system, a coder for converting analog input signals in a predetermined frequency range into a delta modulation signal pulse train representing those analog signals, said coder comprising

means for producing an analog error signal which is indicative of the difference between the information content of the input analog signal in a present sampling time and the information content of a delta modulation representation of that analog signal in an immediately prior sampling time,

means for indicating, in digital form, the error signal level with respect to a predetermined threshold reference in each of plural digital sampling times, said indicating means output error signal having pulse width modulation if it is actuated by an input signal level which is close to the level of said threshold reference,

means for retiming said digital error signal to eliminate said pulse width modulation, the retimed signal being said pulse train,

first means, having an analog integrating characteristic, for coupling the indicating means output to the input of said indicating means,

said coupling means including means for blocking application of direct current through such coupling means between output and input of such indicating means, and

second means for coupling an output of said retiming means to an input of said producing means.

15. In a delta modulation system, a decoder comprising

a bistable trigger circuit for receiving delta modulated digital signals, said trigger circuit having first and second complementary outputs,

an operational amplifier having an inverting input connected to receive signals from said first output of said trigger circuit,

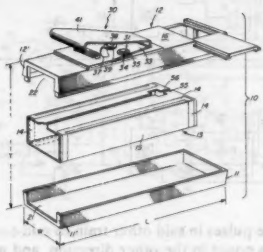
a capacitive feedback circuit connected between an output and said inverting input of said operational amplifier, and

a feed forward circuit coupled between said second output of said bistable circuit and said output of said operational amplifier.

3,956,701
PERSONAL PAGING RECEIVER WITH SWIVEL CLIP AND DISTRIBUTED ANTENNA

Justin Melvin James, Jr., Winchester; Richard LaGrange Smith, Concord; George William Ruggiero, Watertown, and Roger Edge Clapp, Cambridge, all of Mass., assignors to Bell & Howell Company, Chicago, Ill.

Filed Sept. 18, 1974, Ser. No. 506,951
Int. Cl.² H04B 1/08
U.S. Cl. 325—352 **20 Claims**



1. A personal paging device of the kind having radio receiving means within a casing intended to be carried by a person, comprising a casing having a length dimension which is substantially greater than either of its thickness dimension and its width dimension, means for attaching said casing to another body, means pivotally mounting said attaching means to said casing at a location intermediate the ends of said length dimension, said mounting means providing limited freedom to rotate said attaching means relative to said casing through only approximately one-quarter circle, so that with said attaching means attached to an article of clothing worn by a person said casing can be disposed with said length dimension horizontal when said attaching means is at one limit of said freedom, and vertical when said attaching means is at a second limit of said freedom.

3,956,702
BAND DECODER FOR ALL-CHANNEL DIGITAL TUNING SYSTEM

Akio Tanaka, Evanston, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed July 1, 1974, Ser. No. 484,475
Int. Cl.² H04B 1/32
U.S. Cl. 325—459 **14 Claims**

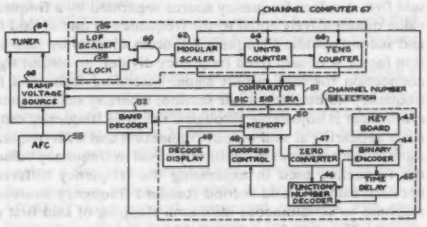
1. A television tuning control system, comprising:

a tuner having a tunable element operating in several predetermined discrete frequency bands containing a plurality of fixed bandwidth signals identified by assigned channel numbers;

tuning frequency counting means, employing preset counts corresponding to said frequency bands and sampling the frequency of said tunable element, for deriving from said frequency information indicative of the channel number of the corresponding receivable television channel;

channel number selection means;

comparison means coupled between said tuning frequency counting means and said channel number selection means for comparing channel number information from said channel number selection means with channel number information from said tuning frequency counting means;



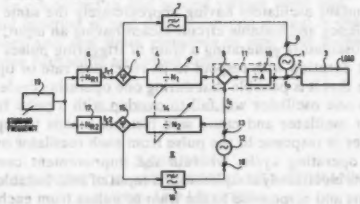
driving means coupled between said tunable element and said comparison means, for driving said tunable element to change frequency in response to said comparison means; and

channel band determination means coupled between said channel number selection means and said tuning frequency counting means for segregating said channel numbers according to their location in said several predetermined discrete frequency bands, said channel band determination means establishing said preset counts for said tuning frequency counting means.

3,956,703
MULTICHANNEL GENERATOR

Johannes Noordanus, and Marie Marcel Arnold Antoine Ghislain Verstraelen, both of Hilversum, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 7, 1975, Ser. No. 565,851
Claims priority, application Netherlands, Apr. 22, 1974, 7405404
Int. Cl.² H03B 19/00
U.S. Cl. 328—14 **4 Claims**



1. Multichannel generator constituted by a frequency synthesizer for producing an output signal variable through a plurality of channel frequencies spaced by uniform frequency steps, said frequency synthesizer comprising a first frequency adjustable circuit section with a first voltage-controlled oscillator (VCO), a first frequency divider adjustable in incremental steps, a first frequency standard source connected to said first frequency adjustable circuit section, and a frequency translation device connected between the oscillator output and the input of said first adjustable frequency divider, characterized in that the said frequency translation device comprises a frequency divider of fixed division factor A whose input is connected to the output of the first voltage-controlled oscillator and a mixer stage included between the output of said fixed frequency divider and the input of said first adjust-

able frequency divider, said frequency synthesizer further comprising a second frequency adjustable circuit section for generating a transposition signal applied to the said mixer stage and including a second voltage-controlled oscillator, a second frequency divider adjustable in incremental steps, with the frequency incremental steps of said first and second adjustable frequency dividers, being of equal step value, and a second standard frequency source connected to said second frequency adjustable circuit section, with the frequency of said second standard frequency source and the frequency of said first standard frequency source separated by a frequency value quantitatively equal to the frequency of one of said first and second standard frequency sources divided by said division factor A of said fixed frequency divider, an output signal connection for said output signal extending from said first frequency adjustable circuit section, whereby said frequency synthesizer is adjustable through a range of frequency output steps appearing at said output connection and with frequency signal output steps each uniformly equal in frequency value to the frequency used in expressing the frequency difference between said first and second standard frequency sources in response to simultaneous minimum stepping of said first and second adjustable frequency dividers.

3,956,704

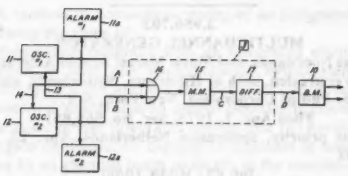
PULSE GENERATING MEANS

Marvin F. Keeney, Jr., Yeadon, and Alfred E. Relation, Merion Station, both of Pa., assignors to General Electric Company, New York, N.Y.

Continuation of Ser. No. 161,260, July 7, 1971, abandoned, which is a continuation of Ser. No. 741,680, July 1, 1968, abandoned. This application Dec. 20, 1972, Ser. No. 316,964

Int. Cl.[2] H03K *1/00, 4/00*

U.S. Cl. 328—61 **4 Claims**



1. In combination first and second parallel phase locked redundant oscillators having approximately the same natural frequency and bistable circuit means having an input, each of said oscillators generating a train of triggering pulses of such short duration with respect to its repetition rate or operating cycle that it is possible that during one operating cycle a pulse from one oscillator will fail to overlap with a pulse from the other oscillator and cause said bistable means to separately trigger in response to the pulse from each oscillator over said one operating cycle, wherein the improvement comprises: means electrically coupled to the input of said bistable circuit means and responsive to the train of pulses from each of said oscillators for insuring that only one pulse during each operating cycle is supplied to the input of and triggers said bistable circuit means and any second non-overlapping pulse during said each operating cycle is inhibited from the input of and prevented from triggering said bistable circuit means.

3,956,705

PULSE RATE COMPARISON CIRCUIT

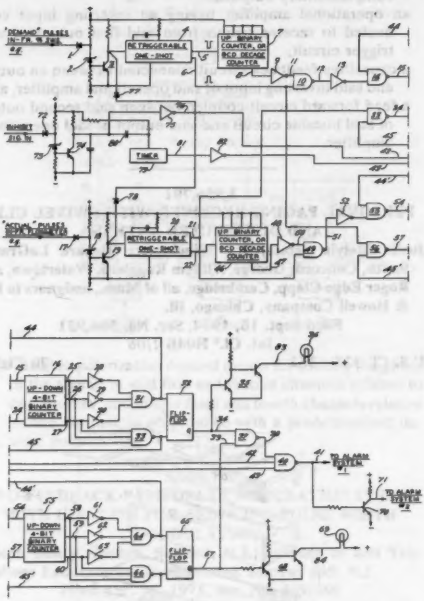
Robert Mayer, Ardmore, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Mar. 15, 1974, Ser. No. 451,720

Int. Cl.[2] H03D *13/00;* **H03K** *5/20*

U.S. Cl. 328—133 **18 Claims**

1. A circuit for comparing the repetition rates of two trains of pulses and for producing an alarm in response to a difference in such rates in excess of a preset value, comprising a bidirectional counter, means for feeding the pulses in one of said trains to said counter to cause the same to count in one direction, means for feeding a preset percentage less than



100% of the pulses in said other train to said counter to cause the same to count in the other direction, and means coupled to said counter for producing an alarm signal upon the count reaching a predetermined count within said counter.

3,956,706

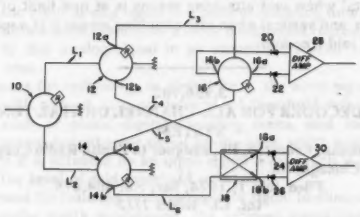
MINIATURIZED MILLIMETER WAVE INSTANTANEOUS FREQUENCY DISCRIMINATOR

David L. Saul, El Cajon, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 3, 1975, Ser. No. 546,367

Int. Cl.[2] G01R *23/04*

U.S. Cl. 328—140 **9 Claims**



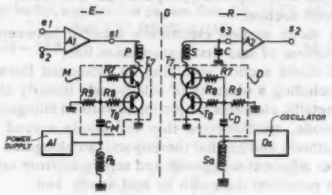
1. An instantaneous frequency discriminator comprising:

a first power divider for dividing the power from an input signal equally, having first and second outputs;

a first electrical conductor connected to said first output of said first power divider;

a second electrical conductor connected to said second output of said first power divider;
a second power divider connected to said first electrical connector;
a third power divider connected to said second electrical connector;
an output 180° hybrid connected to said second and third power dividers;
an output 90° hybrid connected to said second and third power dividers; and
output means connected to said output 180° hybrid and to said output 90° hybrid for outputting signals indicative of the instantaneous frequency of said input signal.

3,956,707
FLOATING MEASUREMENT AMPLIFIER
Jean-Marie Bruyére, 22, rue Louis Blanc, Paris, France (75010)
Filed Jan. 16, 1975, Ser. No. 541,594
Claims priority, application France, Feb. 4, 1974, 74.03586
Int. Cl.² H03F 3/38
U.S. Cl. 330—10 **2 Claims**



1. A floating measuring amplifier comprising:
an emitter comprising:
a primary winding of a signal transformer;
a modulator adapted to feed said primary winding;
a first capacitor having first and second terminals, said first terminal being connected to said modulator;
a primary winding of a feed transformer having first and second terminals; said first terminal of said feed transformer being connected to the second terminal of said first capacitor and said second terminal of said primary winding of said feed transformer being grounded;
a power source connected at the connection point of said first terminal of said primary winding of said feed transformer and said second terminal of said first capacitor;
a reciever stage comprising:
a secondary winding of said signal transformer;
a demodulator adapted to control the feed to said signal transformer secondary winding;
a second capacitor having first and second terminals, said first terminal being connected to said demodulator;
a secondary winding of said feed transformer, said secondary winding of said feed transformer having first and second terminals, said first terminal of said secondary winding of said feed transformer being connected to said second terminal of said second capacitor; said second terminal of said secondary winding of said feed transformer being grounded;
an oscillator connected to said first terminal of said secondary winding of said feed transformer; and
a shield completely separating said receiver from said emitter and isolating said receiver from said emitter galvanically while permitting said receiver and emitter to be coupled ferromagnetically.

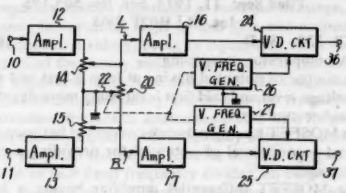
3,956,708
MOSFET COMPARATOR
Fuad H. Musa, Tempe, Ariz., assignor to Motorola, Inc., Chicago, Ill.
Filed Sept. 11, 1974, Ser. No. 505,195
Int. Cl.² H03F 3/68
U.S. Cl. 330—30 D **10 Claims**

1. A comparator comprising:
a. a source of potential having at least a first and a second voltage level and said first level being more negative than said second level;
b. a MOSFET biasing network connected between said first and second level of potential for providing a reference voltage;
c. a MOSFET differential amplifier having a MOSFET constant current source responsive to said reference voltage from said biasing network for providing a constant current, and a MOSFET input stage being connected in series with said constant current source and having a first input terminal and a second input terminal for receiving two input signals to be compared and a MOSFET load network connected in series with said input stage, and an output terminal for providing a single differential output signal; and
d. an output stage responsive to said single differential output signal for providing an amplified output signal, wherein said output stage includes:
e. an N-channel MOSFET device having source, drain and gate electrodes;
f. a first P-channel MOSFET device having source, drain and gate electrodes;
g. a second P-channel MOSFET device having source, drain and gate electrodes;
h. said source electrode of said N-channel device being connected to said first voltage level;
i. said gate electrode of said N-channel device being connected to said gate electrode of said first P-channel device and said gate electrode of ssid N-channel device being further connected to said output terminal of said differential amplifier;
j. said drain electrode of said N-channel device being connected to said drain electrode of said first P-channel device;
k. said source electrode of said first P-channel device being connected to said drain electrode and said gate electrode of said second P-channel MOSFET device;
l. said source electrode of said second P-channel device being connected to said second voltage level; and
m. said junction of said drain electrode of said N-channel device and said drain electrode of said first P-channel device furnishing an output signal.

3,956,709
BALANCE CONTROL SYSTEM FOR MULTICHANNEL AUDIO APPARATUS
Yoshio Osakabe, Yokohama; Koichi Ishizaka, Tokyo, and Sumio Satoh, Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Dec. 19, 1974, Ser. No. 534,302
Claims priority, application Japan, Dec. 27, 1973, 49-14437
Int. Cl.² H03F 3/68
U.S. Cl. 330—124 R **13 Claims**

1. A balance control system for multichannel audio apparatus wherein stereophonic signals are transmitted through at least two audio channels of said audio apparatus, comprising:
adjustable balance control means connected to said audio channels for selectively controlling the relative amplitudes of the respective stereophonic signals transmitted therethrough with respect to each other; and
adjustable signal delay means included in at least one of said audio channels, said signal delay means being adjustable

simultaneously with said balance control means for selectively delaying the stereophonic signal transmitted



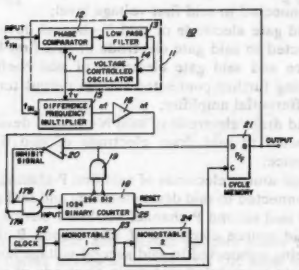
through said one audio channel with respect to the remaining stereophonic signals.

3,956,710

PHASE LOCKED LOOP LOCK DETECTOR AND METHOD

Martin V. Seitz, Fox River Grove, and Harry A. Hennen, Bloomingdale, both of Ill., assignors to Motorola, Inc., Chicago, Ill.

Filed Nov. 20, 1974, Ser. No. 525,521
Int. Cl.² H03B *3/04*
U.S. Cl. 331—1 A **9 Claims**



1. A phase locked loop lock detector which provides a signal indicating when the phase locked loop is in a state of lock, comprising in combination:

a phase locked loop having a phase detector receiving a first signal and a second signal and said loop adjusting the frequency of said second signal such that substantially zero phase error exists between said first and second signals;

difference frequency means including said phase detector coupled for receiving said first and said second signals and producing a third signal having a frequency equal to the difference between said first signal frequency and said second signal frequency;

frequency counter means coupled to said difference frequency means for receiving said third signal and counting the number of transitions of said third signal about an arbitrary reference level;

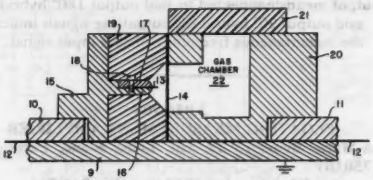
comparator means coupled to said frequency counter means for comparing said number of transitions occurring in a predetermined time period to a predetermined decision level and generating a lock signal indicating the magnitude of said number of transitions occurring in said time period relative to said predetermined decision level.

3,956,711

TRAVELING WAVE TRANSVERSE ELECTRON BEAM FOR LASER PUMPING

Ronald W. Waynant, Laurel, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 23, 1973, Ser. No. 418,344
Int. Cl.² H01S *3/22*
U.S. Cl. 331—94.5 PE **7 Claims**



1. A device for producing a fast-rise, long-path-length, uniform electron beam for short wavelength laser pumping; which comprises,

first and second flat plate electrical transmission lines, separated by a thin insulator,

said first transmission line separated into two separate sections with oppositely disposed parallel faces,

a diode section,

said diode section electrically secured between said two sections of said first transmission line,

said diode section including an elongated linear cathode including a plurality of side-by-side linearly aligned thin metallic elements projecting toward an elongated thin foil anode, an elongated thin foil anode spaced from said cathode and normal thereto and, an elongated gas chamber adjacent said anode and separated from said cathode in parallism therewith by said anode, and

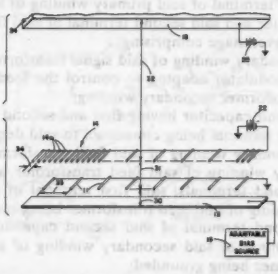
means for sequentially applying a high voltage onto said diode section for generating high energy electrons for passing said high energy electrons through said anode to create a population inversion in a gas in said gas chamber.

3,956,712

AREA ELECTRON GUN

William Hant, Los Angeles, Calif., assignor to Northrop Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 329,572, Feb. 5, 1973, abandoned. This application Sept. 16, 1974, Ser. No. 506,568
Int. Cl.² H01S *3/22, 3/09*
U.S. Cl. 331—94.5 PE **11 Claims**



1. An area electron source for use in preionizing the gas in a gas filled laser cavity comprising:

a plurality of linear thermionic strip filaments for emitting electrons arranged alongside each other in a first predetermined plane,

a spreader electrode consisting of a flat plate positioned in a second predetermined plane parallel to said first plane on one side of said filaments,

a grid comprising a plurality of conductive wires arranged spaced from each other in side by side parallel relationship in a third predetermined plane parallel to said first and second planes and on the other side of said filaments,

an anode comprising a flat metal foil positioned in a fourth predetermined plane parallel to said aforementioned planes on the side of the grid away from the filaments, said foil forming a septum between the electron source and the laser cavity, the electrons penetrating through said foil into the laser cavity, and

means for applying predetermined voltages to the filaments, grid, anode and spreader electrode to cause the electrons emitted by said filaments to have a trajectory towards said anode such as to provide a uniform distribution of said electrons at said anode, the voltage applied to the grid being negative with respect to the voltage applied to the filaments.

3,956,713

ASTABLE MULTIVIBRATOR HAVING ADJUSTABLE PULSE WIDTH AT CONSTANT FREQUENCY

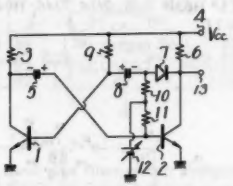
Yoshiaki Ogawara, Inagi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 17, 1974, Ser. No. 533,549

Claims priority, application Japan, Dec. 24, 1973, 48-3148

Int. Cl.² H03K *3/282*

U.S. Cl. 331—113 R **10 Claims**



6. An astable multivibrator circuit for producing an output periodic pulse signal of constant frequency and variable pulse width; comprising:

first and second switching means, each having conducting and non-conducting states and each including a control electrode for receiving a voltage which determines the state thereof and an output electrode for producing a signal representative of said state;

a first capacitor for coupling said output electrode of said first switching means to said control electrode of said second switching means and for applying a voltage to said control electrode of said second switching means;

a series circuit comprised of a unidirectional current conductor and a second capacitor for coupling said output electrode of said second switching means to said control electrode of said first switching means and for applying a voltage to said control electrode of said first switching means;

means for supplying an energizing voltage including means coupled to said second capacitor for charging same when said second switching means is in said conducting state;

a source of DC control voltage for providing a DC control voltage;

a charging circuit for supplying said DC control voltage to said first capacitor for charging said first capacitor to a voltage having a magnitude sufficient to switch said second switching means to its conducting state, the time required to so charge said first capacitor being determined by said DC control voltage; and

a discharging circuit for supplying said DC control voltage to said second capacitor for discharging said second capacitor concurrent with the charging of said first capacitor, said second capacitor being discharged to a level and at a rate determined by said DC control voltage, such that the time required to charge said second capacitor by said means for supplying an energizing voltage to a magnitude sufficient to switch said first switching means to its conducting state is determined by said DC control voltage.

3,956,714

ENERGIZING CIRCUIT WITH INSULATED-GATE FIELD-EFFECT TRANSISTORS FOR CRYSTAL OSCILLATOR

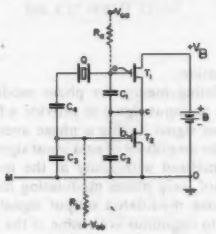
Jakob Lüscher, Carouge, Switzerland, assignor to Battelle Memorial Institute, Carouge, Switzerland

Filed Apr. 1, 1975, Ser. No. 564,061

Claims priority, application Switzerland, Apr. 1, 1974, 4504/74

Int. Cl.² H03B *5/36*

U.S. Cl. 331—116 R **10 Claims**



1. An oscillatory system comprising:

a piezoelectric resonator having a first and a second terminal;

a direct-current supply having a reference pole and a working pole with potentials encompassing a predetermined voltage range;

a first and second field-effect transistor each having a source, a drain and an insulated gate, said transistors forming a series FET pair with the drain of said first transistor connected to said working pole, the source of said second transistor connected to said reference pole and the source of said first transistor forming a junction with the drain of said second transistor;

a capacitive voltage divider having a tap connected to said junction, said voltage divider being inserted between the gate of said first transistor and the source of said second transistor;

a first connection extending from the gate of said first transistor to said first terminal;

a second connection extending from the gate of said second transistor to said second terminal;

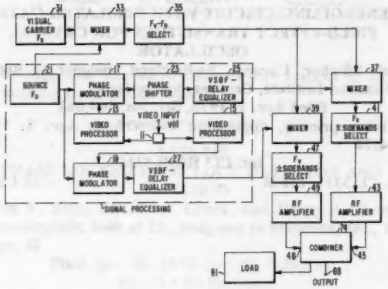
first biasing means connected to the gate of said first transistor for supplying thereto a potential within said voltage range; and

second biasing means connected to the gate of said second transistor for supplying thereto a potential outside said voltage range.

3,956,715
AMPLITUDE MODULATION SYSTEM

William Louis Behrend, Pittsburgh, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 23, 1974, Ser. No. 536,005
Int. Cl.² H03C 1/50, 1/60
U.S. Cl. 332—1 6 Claims



1. In combination,

phase modulating means for phase modulating a carrier signal with an input signal to provide a first phase modulated output signal having a phase according to the arc cosine of the amplitude of said input signal with said input signal normalized with unity at the maximum possible level thereof, said phase modulating means providing a second phase modulated output signal having a phase according to the minus arc cosine of the amplitude of said input signal with said input signal normalized with unity at the maximum possible level thereof,

first filtering means responsive to said first phase modulated signal for providing a first delay equalized vestigial sideband filtered signal,

second filtering means substantially identical to said first filtering means and responsive to said second phase modulated signal for providing a second delay equalized vestigial sideband filtered signal,

means coupled to said first and second filtering means for combining said first and second phase modulated signals to provide a single delay equalized vestigial sideband filtered amplitude modulated output signal.

3,956,716
PULSE WIDTH MODULATED SIGNAL AMPLIFIER

Osamu Hamada, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 26, 1975, Ser. No. 562,144
Claims priority, application Japan, Mar. 28, 1974, 49-35309
Int. Cl.² H03K 7/08
U.S. Cl. 332—12 10 Claims

1. A pulse width modulated signal amplifier comprising:

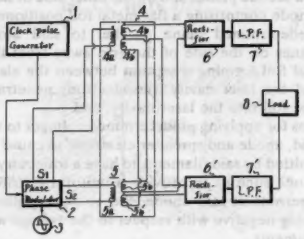
a pulse phase modulator,

a clock pulse generator,

means for supplying a signal input and an output of said clock pulse generator to said pulse phase modulator,

said pulse phase modulator having circuit means for producing a pair of pulse signals having a phase difference which is proportional to the level of said applied signal input,

means for combining said pair of pulses to produce a resulting pulse width modulated signal, and

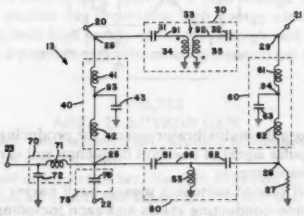


means for applying said pulse width modulated signal to a load.

3,956,717
HYBRID DIPLEXING FILTER

Robert A. Fisher; Alexander W. Gillespie, and Edward D. McCormick, all of Chaska, Minn., assignors to Wideband Services, Inc., Chaska, Minn.

Filed Aug. 1, 1974, Ser. No. 493,527
Int. Cl.² H03H 7/08, 7/14, 7/46; H04R 3/50
U.S. Cl. 333—11 13 Claims



1. In a hybrid diplexing filter which comprises a common port, a high pass port, a low pass port, first filter means connected between said common port and said high pass port for passing high frequency signals therebetween, second filter means connected between said common port and said low pass for passing signals therebetween having a frequency lower than signals passed by said first filter means, third filter means connected to said high pass port for passing low frequency signals, fourth filter means connected between said low pass port and said third filter means for passing high frequency signals, said first, second, third and fourth filter means thereby forming a bridge circuit, said common port of said hybrid diplexing filter inherently having stray capacitances associated therewith, the improvement which comprises a modified bifilar wound transformer included within said first filter means, said transformer having primary and secondary conductors twisted together to a predetermined degree to provide a predetermined amount of leakage inductance for compensating the hybrid diplexing filter for the effects of stray capacitances associated with said common port.

3,956,718
CRYSTALS HAVING ZERO TEMPERATURE COEFFICIENTS OF DELAY

Robert W. Weinert, Monroeville, and Thelma J. Isaacs, Murrysville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

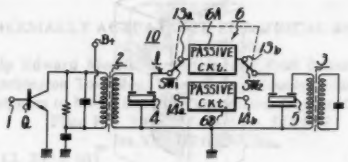
Filed Jan. 10, 1975, Ser. No. 540,194
Int. Cl.² H03H 9/30; H01L 41/18; B01J 17/06
U.S. Cl. 333—30 R 23 Claims

1. A single crystal having the approximate composition Tl_3BX_4, and having a surface selected from the group consisting of surfaces containing a zero temperature coefficient of acoustic delay direction, surfaces normal to a zero temperature coefficient of acoustic delay direction, and both types of surfaces, where B is selected from the group consisting of vanadium, niobium, tantalum, and mixtures thereof, and X is selected from the group consisting of sulfur, selenium, and mixtures thereof.

3,956,719
VARIABLE BAND PASS FILTER CIRCUIT

Toshihiko Waku, and Hiroshi Takeuchi, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 13, 1974, Ser. No. 523,482
Claims priority, application Japan, Nov. 16, 1973, 48-132488[U]
Int. Cl.² H03H 9/26, 9/32
U.S. Cl. 333—72 3 Claims



1. A variable band pass filter circuit comprising first and second ceramic filters, an input terminal connected to the input of said first ceramic filter, an output terminal connected to the output of said second ceramic filter, and first and second passive circuits selectively connected between the output of said first ceramic filter and the input of said second ceramic filter, said first passive circuit comprising a first capacitor which when said first passive circuit is connected has one side which receives the output of said first ceramic filter and its other side connected to the input of said second ceramic filter and said second passive circuit comprising a second capacitor which when said second passive circuit is connected has one side which receives the output of said first ceramic filter and its other side connected to the input of said second ceramic filter and an inductor with one side connected to the input of said second ceramic filter and its other side connected to a reference point.

3,956,720
STORAGE BATTERY ANALYZER

Gary W. Vest, 4480 Broadview Road, Cleveland, Ohio 44109

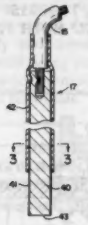
Filed Oct. 4, 1974, Ser. No. 512,208
Int. Cl.² G01N 27/30, 27/46
U.S. Cl. 324—29.5 5 Claims

1. In an instrument for measuring and indicating a storage battery charge level and for indicating potential difference between adjacent battery cells, the instrument including a pair of electrical conductive leads adapted to be immersed in the electrolyte of said adjacent cells, the improvement which comprises:

conductive probes connected at the end of each lead each probe comprising:

an elongated conductive steel element having one end connected to one of said leads, and

a layer of cadmium plating over the side surfaces of said element,

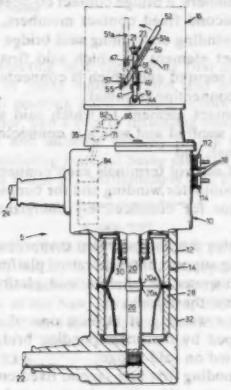


the outer end face of said element being exposed for contact with said electrolyte solution.

3,956,721
FAULT INTERRUPTER

Edwin A. Link, Waukesha, Wis., assignor to RTE Corporation, Waukesha, Wis.

Filed Apr. 16, 1975, Ser. No. 568,721
Int. Cl.² H01H 33/66
U.S. Cl. 335—6 22 Claims



1. A high voltage interrupter comprising:

a circuit interrupter having a fixed contact, a movable contact and means for biasing said movable contact to an open position,

a dielectric housing enclosing said interrupter and having a flexible section spaced from said movable contact,

means connected to said flexible section for manually actuating and resetting said interrupter externally of said flexible section,

and trip means in the space between said flexible section and said movable contact for connecting said actuating and resetting means to said movable contact, said trip means including a releasable linkage assembly for holding said movable contact in the operative position,

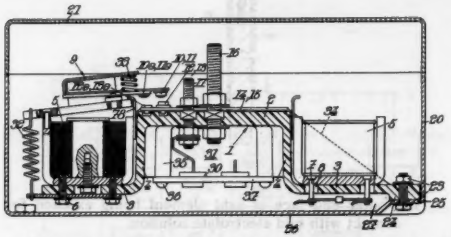
and means responsive to a predetermined signal for tripping said releasable linkage assembly whereby said linkage assembly will collapse due to said biasing means acting on said movable contact to open said interrupter.

3,956,722

EDDY CURRENT RETARDER CONTROL DEVICE

Roger Lagarde, Aulnay-sous-Bois, France, assignor to Labavia-S.G.E., France

Filed Nov. 21, 1974, Ser. No. 525,811
Claims priority, application France, Nov. 21, 1973, 73.41412; Apr. 16, 1974, 74.13215
Int. Cl.² H01H 51/30
U.S. Cl. 335—103 17 Claims



1. A control device for an eddy current retarder having a plurality of energizing windings, comprising:
an insulating support;
a plurality of connecting terminals mounted on said support for connection to respective retarder windings;
a junction terminal mounted on said support for connection to one pole of a power supply;
a plurality of contactors corresponding to said connecting terminals;
each said contactor comprising first and second fixed contact members, a bridge contact co-operating with said first and second fixed contact members, and a pull-on contactor winding controlling said bridge contact;
a first contact element to which said first fixed contact member is secured and which is connected to the corresponding connecting terminal;
a second contact element to which said second contact member is secured and which is connected to said junction terminal; and
a plurality of control terminals each connected to a corresponding contactor winding and for connection to a control selector for consecutively energizing said control terminals;
in which device the improvement comprises:
said insulating support having a raised platform and a flange which is disposed parallel to said platform and downwardly offset therefrom;
said contactor winding of at least one of said contactors being topped by the corresponding bridge contact and being carried on said flange;
said corresponding first and second fixed contact members and said contact elements being mounted directly on said platform.

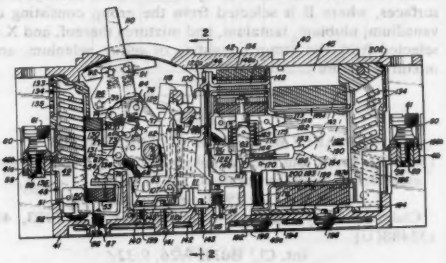
3,956,723

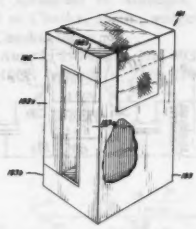
CURRENT LIMITING CIRCUIT BREAKER

Richard T. Dickens, Iowa City, and Joseph M. Khalid, Cedar Rapids, both of Iowa, assignors to Square D Company, Park Ridge, Ill.

Filed Apr. 29, 1974, Ser. No. 465,397
Int. Cl.² H01H 9/30
U.S. Cl. 335—201 4 Claims

1. An electric circuit interrupting device comprising a molded case, a pair of separable contacts in the case, an elongated movable contact arm to carry one of said contacts, between a contact open and contact closed position, a magnetic core structure in the case substantially completely encircling the contacts and encircling a substantial current carrying portion of said elongated movable contact arm which extends rearwardly of said contacts, said magnetic core including a pair of spaced apart upright magnet walls, one of said magnet walls being on one side of said contacts and the other of said magnet walls being on the opposite side of said contacts, said walls extending upright in the same direction as the direction of contact separation, said walls being imperforate and unbroken defining a cavity therebetween, a first unobstructed opening to said cavity defined by corresponding longitudinal edges of said pair of magnet walls, said first opening being spaced forwardly of said contacts in a direction to provide an outlet toward which an arc and shock waves associated with such arc can move, a second opening to said cavity defined by corresponding longitudinal edges at the opposite end of said pair of magnet walls, said second opening being spaced rearwardly of





said contacts a distance substantially equal to said portion of said elongated movable contact arm extending rearwardly of said contacts which is encircled by said magnetic core structure, said magnetic core thereby including a first forwardly extending cavity portion extending between said contacts and said first opening to provide a transverse magnetic field to coact with an arc for movement thereof from said contacts toward said first opening, and a second rearwardly extending cavity portion extending between said contacts and said second opening to provide a transverse magnetic field to coact with said current carrying portion of said elongated movable contact arm for movement thereof in a contact opening direction.

3,956,724

SUPERCONDUCTIVE WINDING WITH COOLING PASSAGES

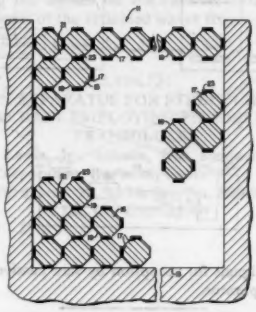
Thomas J. Fagan, Jr., Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 307,315, Nov. 16, 1972, now Defensive Publication No. T913,004. This application Dec. 12, 1974, Ser. No. 532,286
Int. Cl.² H01F 7/22
U.S. Cl. 335—216 8 Claims

1. An electrical winding comprising:
a multiplicity of tightly packed conductors, each of said conductors having a cross-section in the form of a polygon with a multiplicity of sides;
a plurality of contacting faces formed on the circumference of each of said conductors and providing some of the sides of said polygon, each of said contacting faces posi-

tively engaging a contacting face of an adjacent conductor; and

a plurality of noncontacting faces formed on the circumference of each of said conductors and providing some of



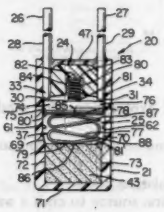
the sides of said polygon, the engagement of said contacting faces of adjacent conductors causing said conductors to be spaced as to establish passages through the winding, said noncontacting faces of said conductors providing closed peripheries for the passages.

3,956,725

THERMALLY ACTUATABLE ELECTRICAL SWITCH CONSTRUCTION

Phillip Edward Merrill, Kettering, and Emil Robert Plasko, Washington Township, Montgomery County, both of Ohio, assignors to Micro Devices Corporation, Dayton, Ohio

Filed Feb. 10, 1975, Ser. No. 548,665
Int. Cl.² H01H 37/76
U.S. Cl. 337—407 **4 Claims**



1. A thermally actuatable switch comprising

a. a housing provided with a relatively thin and wide internal chamber which is closed out at the bottom and open at the top,

b. a pair of spaced apart terminals extending into the top of said chamber,

c. an end plug snap fitted into said housing to close out the top of said chamber and secure said terminals in place,

d. a cylindrical contact having a diameter extending substantially across the entire thickness of said chamber and a length extending substantially the full width of said chamber,

e. a coil spring fitted within said end plug between said terminals for urging said contact member downwardly away from said terminals,

f. a temperature sensitive member fitted into the lower section of said chamber, which said temperature sensitive member is solid at temperatures below a predetermined design temperature and collapses at temperatures above said design temperature, and

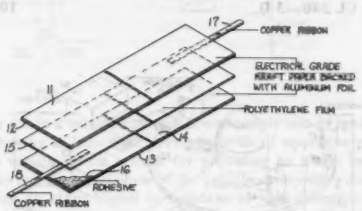
g. a reversely looped leaf spring extending across substantially the full thickness and width of said chamber and placed between said temperature sensitive member and said contact member to overcome the action of said coil spring and urge said contact member against said terminals, said leaf spring comprising a C-shaped center section and a pair of reversely bent free ends disposed respectively upwardly and downwardly from said center section, said free ends being medially bent to bear medially against said contact member for causing flush seating thereof against said terminals.

3,956,726

HEAT DETECTING CONDUCTOR AND CIRCUIT

John J. McCarthy, Bethany, Conn., and Kenneth C. Starkey, Grove City, Ohio, assignors to Cerro Corporation, New York, N.Y.

Filed Dec. 23, 1974, Ser. No. 535,827
Int. Cl.² H01H 37/76
U.S. Cl. 337—414 **9 Claims**



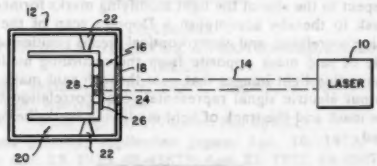
1. A heat detecting tape comprising first and second supporting strips of sheet material, first and second strips of conductive foil backing each of said supporting strips and facing each other, and a film of insulating material separating said foil strips and adhered directly to the facing surfaces thereof, said insulating material being selected to have a melting point in the range of approximately 200°F. to 500°F.

3,956,727

LASER ACTIVATED SUPERCONDUCTING SWITCH

Alfred A. Wolf, R.F.D. 3, Box 327, Annapolis, Md. 21402, assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 16, 1974, Ser. No. 533,116
Int. Cl.² H01C 7/16
U.S. Cl. 338—32 S **9 Claims**



1. A laser activated superconducting switch comprising:

a superconducting material in the form of a strip cut to have opposing ends physically and electrically separated from each other, and maintained at a temperature below its critical transition temperature to thereby be superconducting;

a ceramic piece interposed between the opposing ends and substantially flush with the surfaces of said superconducting material strip for electrical insulation and mechanical support;

a cryogenic container for containing said superconducting material;

a window in said container in optical alignment with said conductor and of such material as will transmit the frequency of a desired laser beam;

a laser outside said container emitting a low power beam, and having a frequency at or above the optical frequency of said superconducting material, to pass through said window when desired to impinge upon said superconducting material to normalize the same;

whereby said switch may be normalized remotely and no heating in said superconducting material occurs within said container.

3,956,728

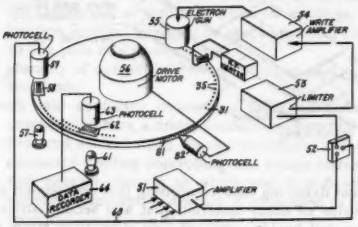
SIGNAL CORRELATION SYSTEM

David E. Wood, Schenectady, and William T. Gannon, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 15, 1961, Ser. No. 160,699

Int. Cl.[2] G01S 9/66

U.S. Cl. 340—3 D **10 Claims**



1. A pulse correlation readout system for a track of light modifying marks formed in a recording medium comprising a light source positioned to direct light onto the recording medium, a mask having a coded series of light modifying marks formed therein representing the signal with which correlation is sought, optical means for optically imaging the light emanating from said recording medium onto said mask, said optical means including image magnifying means, and means for varying the magnification of said image magnifying means whereby the size of the light image of the light modifying marks formed in the recording medium may be varied with respect to the size of the light modifying marks formed in the mask to thereby accomplish a Doppler scan of the signals being correlated, and electro-optical means positioned on the side of said mask opposite from the recording medium for converting light images that pass through said mask into an output electric signal representative of correlation between the mask and the track of light modifying marks being examined.

3,956,729

COUNTERMEASURES APPARATUS

David Epstein, and Sidney Epstein, both of 3611 Flatlands Ave., Brooklyn, N.Y. 11234

Filed May 12, 1964, Ser. No. 367,608

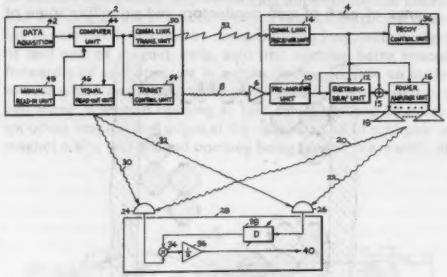
Int. Cl.[2] H04K 3/00

U.S. Cl. 340—5 D **6 Claims**

1. A method of deceiving passive correlation measuring apparatus comprising

the step of

reradiating a plurality of substantial replicas of the target noise signature so separated as to provide a plurality of discrete



correlatable signals for reception by said passive correlation measuring apparatus.

3,956,730

SEISMIC EXPLORATION

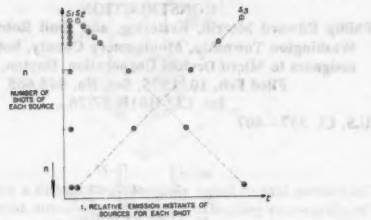
Maurice Barbier, Ousse, France, assignor to Societe Nationale des Petroles d'Aquitaine, Courbevoie, France

Continuation of Ser. No. 222,198, Jan. 31, 1972, abandoned. This application May 14, 1974, Ser. No. 469,873

Claims priority, application France, Feb. 2, 1971, 71.03480

Int. Cl.[2] G01V 1/13

U.S. Cl. 340—15.5 CP **5 Claims**



1. A method of exploration of a medium comprising the steps of:

providing first and second emission sources in a reference plane;

during a first emission cycle

causing said first source to emit a wave into a medium at a first instant, and

causing said second source to emit a wave into a medium at a second instant different from and after the first instant;

said first and second instants being separated by a time interval shorter than the outward and return, that is to say, the round-trip travel time of the longest wave from said sources propagated in the medium to be explored;

during a second emission cycle

causing one of said sources to emit another wave into the medium at a first instant separated from said second instant of the first cycle by a time period at least

as great as the round-trip travel time of the wave emitted at said second instant of the first cycle, and

causing another source to emit another wave into the medium at a second instant after the first instant of the second cycle;

said first and second instants of the second cycle being separated by a time interval less than the round-trip travel time of the wave emitted at the second instant of the first cycle, and the time interval between the first and second instants of the second cycle being different from the time

interval between the first and second instants of the first cycle;

recording the instant of each such emission of each source;

picking up on a receiver, the waves reflected in the medium as a result of each such emission; and

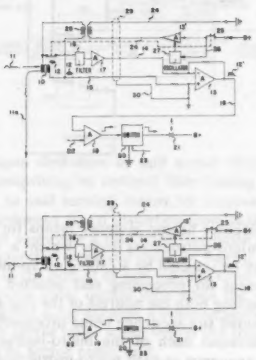
processing the signals on the receiver to determine the travel times of the reflected waves from each source.

3,956,731

DETECTION APPARATUS FOR STRUCTURAL FAILURE IN AIRCRAFT EMPLOYING PIEZOELECTRIC TRANSDUCERS

William H. Lewis, Jr., Atlanta, Ga., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Sept. 27, 1974, Ser. No. 509,915
Int. Cl.² G08G 5/00
U.S. Cl. 340—27 R **6 Claims**



1. An apparatus for the detection of structural failures in aircraft comprising:

at least one pair of piezoelectric transducers adapted to be secured to a component of the aircraft in a predetermined area, each of said transducers being sized for a specific resonance and adapted to convert said resonance into electrical energy of a predetermined frequency;

a first electrical circuit connected to each transducer and including a filter and a differential amplifier to pass only signals of a selected frequency, a voltage level detector to receive said selected frequency signals and preset to pass only signals of a predetermined voltage, a switch responsive to said predetermined voltage signals and an indicator actuated by the operation of said switch; and

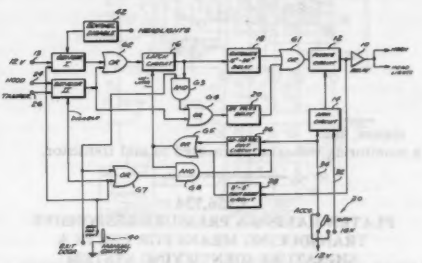
a second electrical circuit connected to each transducer and including a power line with an on-off control, an oscillator activated by said control when operative to generate electrical signals in the associated second circuit at the predetermined frequency aforesaid and a transformer to amplify the voltage of said generated signals to a level sufficient to pass the voltage level detector aforesaid, said on-off control including a circuit maker and breaker in said first circuit and being operative to alternately connect either one of said circuits.

3,956,732

AUTOMOBILE THEFT ALARM WITH IGNITION CONTROLLED AUTOMATIC ARMING MEANS

Rudor M. Teich, 6040 Blvd. East, West New York, N.J. 07093

Continuation-in-part of Ser. No. 217,181, Jan. 12, 1972, Pat. No. 3,740,713, which is a continuation-in-part of Ser. No. 86,222, Nov. 2, 1970, Pat. No. 3,671,934. This application Jan. 2, 1973, Ser. No. 320,542
Int. Cl.² B60R 25/10
U.S. Cl. 340—64 **5 Claims**



1. For use in a vehicle having a power supply and an ignition switch having at least first, second and third operative positions, a vehicle alarm system for providing an alarm in response to unauthorized entry of the vehicle, comprising means producing an alarm signal in response to said unauthorized entry, alarm means, alarm energizing means connected in operative circuit arrangement with said alarm means, and adapted when activated to energize said alarm means to produce said alarm, means adapted to sense said alarm signal and effective, in response to an alarm signal so sensed, to activate said alarm energizing means, first and second lead lines, said ignition switch, in said first position, being adapted to connect said first lead line to said power supply, in said second position to connect said first and second lead lines to said power supply, and in said third position to disconnect said first and second lead lines from said power supply, disarm means operatively connected to one of said first and said second lead lines and to said alarm energizing means and adapted to be activated by said power supply and when so activated to disarm said alarm energizing means to prevent energization of said alarm, said disarm means, once activated, normally remaining latched in its activated condition to maintain said alarm disarmed, and means operatively connected to said second lead line to prevent said disarm means from latching when said ignition switch is in said second position.

3,956,733

MONITORING SYSTEM FOR AN AUTOMOBILE LIGHT CIRCUIT

Yasuhiko Sakurai, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 8, 1974, Ser. No. 459,211
Claims priority, application Japan, Apr. 10, 1973, 48-41171; Apr. 23, 1973, 48-45873; Apr. 23, 1973, 48-45874
Int. Cl.² B60Q 1/26
U.S. Cl. 340—79 **10 Claims**

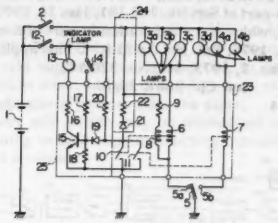
1. A monitoring system for an automobile light circuit including at least one lamp and a lamp lighting switch for supplying power to said lamp from a power supply, said monitoring system comprising:

a current coil connected in series with said lamp;

switch means for opening and closing in accordance with a magnetomotive force of said current coil;

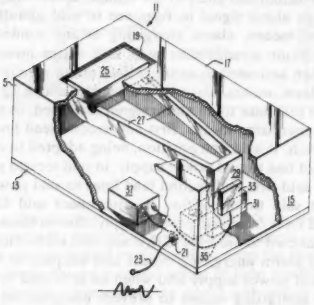
a transistor connected to said switch means for being switched on and off in accordance with the opening and

closing of said switch means;
a diode connected between said lamp and said switch



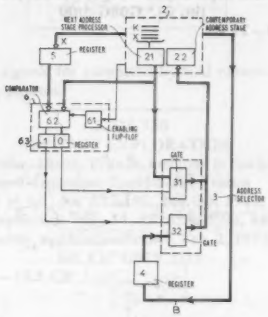
means; and
a monitoring indicator connected to said transistor.

3,956,734
PLATEN HAVING A PRESSURE-RESPONSIVE TRANSDUCING MEANS FOR USE IN A SIGNATURE-IDENTIFYING SYSTEM
Arthur J. Radcliffe, Jr., Ann Arbor, Mich., assignor to Burroughs Corporation, Detroit, Mich.
Filed Nov. 18, 1974, Ser. No. 524,969
Int. Cl.² G06K 9/00
U.S. Cl. 340—146.3 SY **6 Claims**



1. Pressure transducing apparatus for converting the pressure variations inherent in an individual's act of signing his signature into electrical signals representative thereof comprising:
a relatively rigid vertical support means;
horizontal support means having one end attached to the upper portion of said vertical support means;
writing surface means attached to the other end of said horizontal support means for providing a writing surface upon which an individual may sign his signature; and
flexing sensor means attached to said vertical support means and responsive to the pressure variations exerted on said writing surface means and transmitted to said vertical support means by said horizontal support means, said flexing sensor means including:
a first and second vertically oriented strip of piezoelectric material, means for coupling one end of said first strip of piezoelectric material to ground, means for coupling the opposite end of said first strip of piezoelectric material to one end of said second strip of piezoelectric material, and means coupled to the opposite end of said second strip of piezoelectric material for transmitting an electrical signal indicative of the pressure variations inherent in an individual's act of handwriting his signature when the varying stresses or strains in said vertical support member generate varying amounts of current in said strips of piezoelectric material.

3,956,735
SEQUENTIAL MICRO-INSTRUCTION SELECTION APPARATUS
Jean-Claude Marcel Cassonnet, Conflans-St.-Honorine, France, assignor to Compagnie Honeywell Bull (Societe Anonyme), Paris, France
Filed Dec. 14, 1973, Ser. No. 424,708
Claims priority, application France, Dec. 14, 1972, 72.44557
Int. Cl.² G06F 9/16
U.S. Cl. 340—172.5 **5 Claims**



1. In a computer having memory means for storing a sequence of micro-instructions from which a selected subsequence may be selected by a calling micro-instruction, and processor means for processing said selected sub-sequence and for outputting both the address of the end micro-instruction of a selected sub-sequence being processed and sequentially the addresses each of the micro-instructions of said selected sub-sequence as each micro-instruction is being processed, an apparatus whereby said selected sub-sequence may terminate at any micro-instruction of said sequence of micro-instructions, said apparatus comprising:
address selector means connected to said sequential address outputs of the processor means for controlling said processor means normally to process micro-instructions of said sub-sequence sequentially; and
means connected to said address output corresponding to the end of said selected sub-sequence, to said sequential address outputs and to said address selector means for causing the latter to terminate a selected sub-sequence when said sequential address output coincides with said end of said selected sub-sequence.

3,956,736
DISC CARTRIDGE SECTOR FORMATTING ARRANGEMENT AND RECORD ADDRESSING SYSTEM
James O. Jacques, 6625 Bluebird Ave., Longmont, Colo. 80501; Richard D. Cordano, 4120 Eutaw Drive, Boulder, Colo. 80302; Robert F. Heidecker, 1046 Stuart St., Longmont, Colo. 80501, and Friedrich R. Hertrich, Sugarloaf Road, Boulder, Colo. 80302
Continuation of Ser. No. 256,602, May 24, 1972, abandoned.
This application Mar. 18, 1974, Ser. No. 452,157
Int. Cl.² G06F 13/00
U.S. Cl. 340—172.5 **14 Claims**

1. In a computer controlled magnetic disc formatting arrangement of the type wherein sector mark code signals and format data signals are supplied to a write head for recording on a disc to be formatted, the improvement comprising:

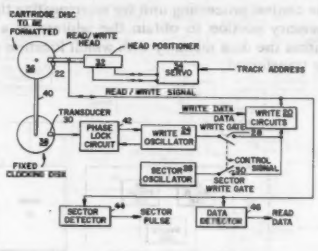
a first oscillator for supplying a recording clock for said format data signals at a first frequency;

a second oscillator for supplying a recording clock for said sector mark code signals at a second frequency;

switching means for connecting said first oscillator output to said write head during recording to said sector mark code signals and for connecting said second oscillator output to said write head recording of said format data signals;

sensing means for reading the signals recorded on said disc by said write head;

sector detection circuit means having an input responsive to said sensing means for producing a sector pulse to an



output upon detection of said sector detection circuit means comprising an optimal filter having an input responsive to said sensing means for removing noise and other extraneous signal distortion from said sector mark signal and supplying a filtered sector pulse at an output, and an adaptive threshold detector having an input responsive to the output of said optimal filter for providing a final sector pulse output only when the width of said filtered sector pulse exceeds a selected percentage of the maximum sector pulse width within the track containing said filtered sector pulse; and,

data detection means having an input responsive to said sensing means for providing a data checking signal at an output for certification thereof.

3,956,737

MEMORY SYSTEM WITH PARALLEL ACCESS TO MULTI-WORD BLOCKS

Roger James Ball, 10 Radnormere Drive, Cheadle Hume, Cheshire, England

Filed July 12, 1974, Ser. No. 488,201

Claims priority, application United Kingdom, July 19, 1973, 34428/73

Int. Cl.² G06F 9/08

U.S. Cl. 340—172.5 **4 Claims**

1. A memory arrangement for data processing apparatus, comprising:

memory means for holding a plurality of multi-word blocks of information, each block being individually addressable to permit writing to all the words in that block in parallel;

first input means for receiving a stream of data words for writing into the memory means;

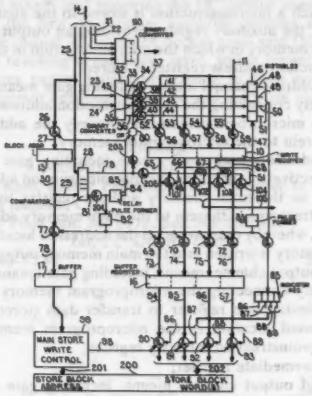
second intput means for receiving with each said data word a block address identifying which block of the memory means that data word is to be written into;

register means for holding a plurality of data words;

first gating means for gating consecutively received data words from said first input means into said register means;

means connected to said second input means for detecting changes in the received block address and producing a change indication signal upon detection of such a change; and

second gating means responsive to said change indication



signal for gating the data words in said register means in parallel to said memory means.

3,956,738

CONTROL UNIT FOR A MICROPROGRAMMED COMPUTER WITH OVERLAPPING OF THE EXECUTIVE AND INTERPRETATIVE PHASE OF TWO SUBSEQUENT MICROINSTRUCTIONS

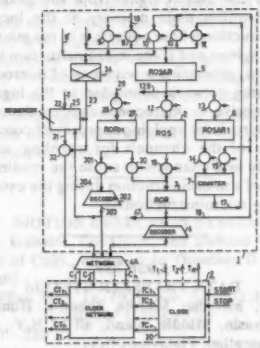
Giancarlo Tessera, Milan, Italy, assignor to Honeywell Information Systems, Inc., Phoenix, Ariz.

Filed Sept. 24, 1974, Ser. No. 508,785

Claims priority, application Italy, Sept. 25, 1973, 29387/73

Int. Cl.² G06F 9/00

U.S. Cl. 340—172.5 **3 Claims**



1. In a microprogrammed computer having a main memory adapted to store microinstructions, sets of microinstructions forming microprograms; a main memory address register for storing the address of a location in main memory; and a main memory output register for storing data read out of a location in main memory corresponding to the address stored in the main memory address register; the improvements comprising:

a microprogram memory for storing a plurality of microprograms;

a microinstruction address register for receiving and storing the address of a microinstruction, the address including data identifying the microprogram memory or the main memory as the memory in which each microinstruction is stored;

a microinstruction register for storing microinstructions;
auxiliary register means;
means for applying the data identifying the memory in which a microinstruction is stored to the auxiliary register, the auxiliary register providing an output identifying the memory in which the microinstruction in the microinstruction address register is stored;
first address channel means including gate means for selectively connecting the microinstruction address register to the microprogram memory to apply the address stored therein to the microprogram memory;
second address channel means including gate means for selectively connecting the microinstruction address register to the main memory address register to apply the address stored therein to the main memory address register, whereby data stored at the addressed location in main memory is written into the main memory output register;
first output channel means, including gate means, for selectively connecting the microprogram memory to the microinstruction register to transfer data stored at an addressed location in the microprogram memory to the microinstruction memory register;
an intermediate register;
second output channel means, including gate means, for selectively connecting the main memory output register to the intermediate register, said intermediate register storing the contents of the main memory output register therein and for connecting the intermediate register to the microinstruction register to transfer data stored in the intermediate register to the microinstruction register;
a logic sequencer circuit;
circuit means for applying the output of the auxiliary register means to the logic sequencer;
a decoder network connected to the intermediate register to test instructions stored therein to determine if the instruction is a jump microinstruction and to produce outputs identifying the presence or absence of a jump microinstruction;
circuit means for applying the output of the decoder network to the logic sequencer circuit, said logic sequencer circuit, if the output signal from the auxiliary register means identifies main memory as the location of the microinstruction whose address is in the microinstruction address register and if the microinstruction is not a jump instruction, generating a sequence of microcommands;
a conditioning network connected to the logic sequencer and responsive to microcommands produced by the sequencer circuit for applying appropriate control signals to the gates of the channels for enabling and inhibiting selectively said channels to cause the reading from main memory of a microinstruction during the execution of the preceding microinstruction.

3,956,739

DATA TRANSFER SYSTEM

David Ophir, Melville; Marvin Shapiro, Huntington, and Bruce Komusin, Middle Island, all of N.Y., assignors to Ontel Corporation, Plainview, N.Y.

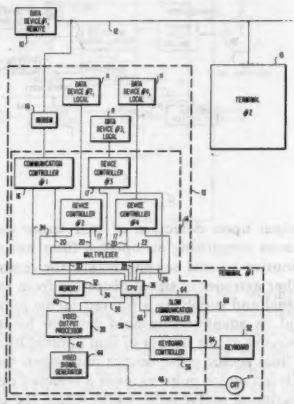
Continuation-in-part of Ser. No. 448,759, March 6, 1974, Pat. No. 3,921,148. This application Apr. 18, 1975, Ser. No. 569,265

Int. Cl.[2] G06F *3/00*

U.S. Cl. 340—172.5 **16 Claims**

1. In a data system including a data device, a device controller, a data memory, and a central processing unit, wherein normally the central processing unit includes means for storing and executing detailed instructions for controlling data transfer and the device controller includes instruction decoders, registers for storing information such as address information and control information, and control circuitry responsive to such information for causing transfer of data messages between the data device and the data memory, the improvement comprising:

a. a first memory portion within said data memory and assigned to the device controller for storing address information;
b. a second memory portion within said data memory and assigned to the device controller for storing address information;
c. a third memory portion within said data memory and assigned to the device controller for storing control information; and
d. a multiplexer including:
1. first means responsive to activation by the central processing unit for interrogating the first memory portion to obtain the address of a location within the data memory with which data is to be transferred;
2. second means responsive to alternative activation by the central processing unit for interrogating the second memory portion to obtain the address of a location within the data memory with which location data is to be transferred;



3. third means for storing address information obtained from the interrogated one of the first and the second memory portions;
4. a data buffer coupled to said device controller for transfer of data therebetween;
5. fourth means coupled to said data buffer, to said third means, and to said data memory for transferring a data character between the data buffer and the location within the data memory identified by the address information stored within said third means;
6. fifth means for interrogating said third memory portion to obtain control information pertaining to the data transfer;
7. sixth means for storing control information obtained from the third memory portion; and
8. evaluation means coupled to said sixth means for evaluating the data transfer and the control information to provide an evaluation output signal indicative of the evaluation of the data transfer.

3,956,740

PORTABLE DATA ENTRY APPARATUS

Michael Dale Jones; David Alan Johnson; Carl Taylor Wright, and William Sherman Bell, Jr., all of Houston, Tex., assignors to Texon Corporation, Houston, Tex.

Filed Nov. 29, 1974, Ser. No. 528,441

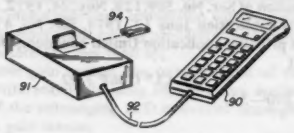
Int. Cl.[2] G06F *13/00, 13/04;* G11B *5/00, 15/18*

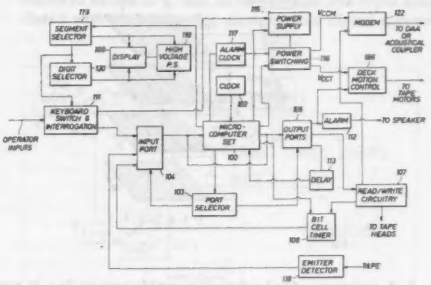
U.S. Cl. 340—172.5 **4 Claims**

1. In a battery-powered portable data entry system including a keyboard unit, a microcomputer set for generating entry signals responsive to depression of keys of said keyboard unit,

and recording means connected to the output of said set, the improvement comprising:

a. a tape connected to said recording means, for storing digitized coded entry signals;





b. operator-actuable means including said keyboard for searching said tape to automatically determine the presence of a selected coded entry signal; and

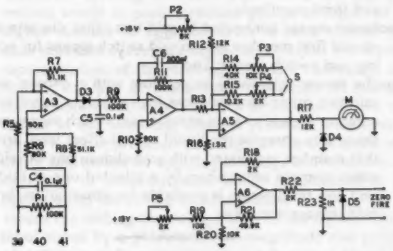
c. operator-actuable means for automatically positioning said tape, after said search function, at the last recorded entry signal on said tape.

3,956,741

BI-DIRECTIONAL ZERO RADIUS AUTO-FIRE PROBE AND AMPLIFIER

Ronald G. Kraus, Akron, Ohio, assignor to Kraus Instruments, Inc., Stow, Ohio

Filed June 14, 1973, Ser. No. 369,874
Int. Cl.² G08C *19/08*
U.S. Cl. 340—199 **11 Claims**



1. A probe circuit for utilization with a digital height gauge for creating signals indicating such contacting engagement between the probe and a work piece that a measurement should be taken, comprising:

an LVDT having primary and secondary coils and a core positioned therebetween;

a probe having a tip thereon operatively connected to and movable with the coils;

rectifier circuit means connected to the LVDT for receiving electrical signals therefrom indicative of the positional relationship between the coils and the core and producing a DC output signal proportional to said positional relationship, said rectifier circuit means including bias means for producing a bias voltage related to the radius of the probe tip; and

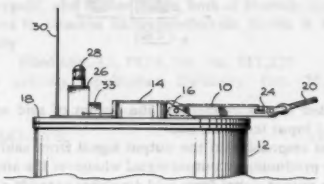
a first operational amplifier connected to said rectifier circuit means and receiving the DC output signal therefrom, the first operational amplifier creating a binary change output signal which occurs upon said DC output signal reaching a particular level, which binary change indicates probe deflection relating to such contacting engagement between the probe and the work piece.

3,956,742

MOORING LOAD SENSOR

Robert D. Karl, Pacific Palisades, Calif., assignor to Imodco, Inc., Los Angeles, Calif.

Filed Jan. 30, 1975, Ser. No. 545,420
Int. Cl.² G08B *21/00*
U.S. Cl. 340—224 **5 Claims**



1. In a mooring arrangement for a ship of the type wherein a mooring means has a mooring arm to which a ship ties up to be moored, the improvement comprising

strain guage means on said mooring arm surface for generating an output signal indicative of the strain being applied to said mooring arm,

means for establishing a reference level signal representing the value of a strain which should be brought to the ship's attention,

means for comparing said strain gauge output signal and said reference level signal for generating a warning signal when said strain guage signal equals or exceeds the said reference level signal, and

means responsive to said warning signal for indicating to said ship the occurrence of said warning signal including means on said mooring means activated in response to said warning signal for producing an audio and visual indication of the occurrence of said warning signal for a predetermined interval.

3,956,743

MOTION DETECTION SYSTEM

Theodore D. Geiszler, Los Gatos, and Richard Wilenken, San Jose, both of Calif., assignors to Theodore D. Geiszler, Los Gatos, Calif.

Filed Mar. 14, 1973, Ser. No. 341,171
Int. Cl.² G08B *13/24*
U.S. Cl. 340—258 C **21 Claims**

1. A detection apparatus for sensing the change in electrostatic charge caused by the disturbance of the electric field within the range of said apparatus comprising in combination:

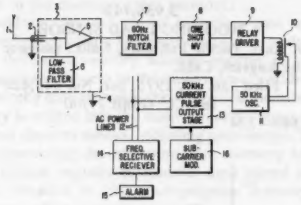
a high impedance antenna for sensing the electric field;

a charge detection circuit including an input terminal, an amplifying circuit having an input stage with a high input impedance and a low leakage current and at least one amplifying stage with a large voltage gain, means for connecting the signal input of said input stage to said input terminal, a first high ohmic input resistance connected between said signal input of said input stage and ground, and filter means connected to said signal inut for filtering out signals above approximately 20Hz;

said amplifying circuit including an operational amplifier having inverting and non-inverting inputs with said non-

inverting input constituting said signal input of said input stage, a second resistance connected between the output of said operational amplifier and said inverting input to provide a feedback path for said amplifier, and a third resistance connecting said inverting input to ground;

means for shielding said charge detection circuit from stray signals;



shielded means connecting the output of said antenna to said input terminal; and

means responsive to the output signal from said amplifier for producing an output signal whenever the amplitude of the output signal from said amplifier exceeds a predetermined value.

3,956,744

NUMERAL OUTPUT SYSTEM FOR CIRCULATING REGISTER

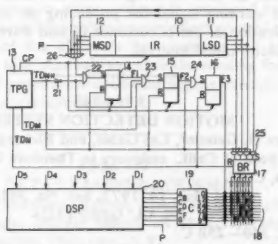
Ichiro Sado, and Mitsuaki Seki, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 3, 1974, Ser. No. 430,568

Claims priority, application Japan, Jan. 10, 1973, 48-5775; Jan. 11, 1973, 48-6201; Jan. 12, 1973, 48-6339; Jan. 18, 1973, 48-8122

Int. Cl.² G08B 5/36

U.S. Cl. 340—324 R **29 Claims**



1. A numeral output system for a register comprising:

a first register having a plurality of digit states for storing therein at least binary coded output numeral information;

a second register for storing sequentially therein one digit of the binary coded output numeral information from said first register;

output means for visually displaying the binary coded output numeral information of said second register; and

means providing a blanking time between adjacent binary coded output numeral signals which are transferred from said second register to said output means, for blanking the visual display of said output means during intervals between said adjacent signals.

3,956,745

PROGRAMMABLE KEYBOARD ARRANGEMENTS

Alfred Brian Edwin Ellis, Chelmsford, England, assignor to The Marconi Company Limited, Chelmsford, England

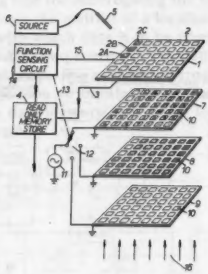
Continuation of Ser. No. 309,129, Nov. 24, 1972, abandoned.

This application June 12, 1974, Ser. No. 478,612

Claims priority, application United Kingdom, Dec. 16, 1971, 58577/71

Int. Cl.² G06F 3/02

U.S. Cl. 340—337 **8 Claims**



1. A programmable keyboard assembly comprising, in combination:

a first member presenting an array of discrete electrically conductive areas at least some of which are transparent and at least two other discrete areas;

a second member underlying said first member and presenting a second array of discrete areas which are aligned with those discrete areas of the first member which are transparent, said discrete areas of the second array thereof being in the form of liquid crystal effect labels;

a third member underlying said second member and presenting a third array of discrete areas which are aligned with said discrete areas of the first member which are transparent, said discrete areas of the third array thereof being in the form of liquid crystal effect labels;

means for energizing liquid crystal effect labels to render them visible to an observer;

switch means for selectively connecting said means for energizing to the liquid crystal effect labels of said second and third members;

actuator means connected to said two other discrete areas of said first member and to said switch means for actuating said switch means; and

probe means selectively engageable with a chosen one of said two other discrete areas for relaying a signal to said actuator means so as to actuate said switch means and to cause it to energize the liquid crystal effect label array of that member associated with said chosen one of said two other discrete areas whereby a selected one of said second and third arrays is available for observation through said transparent areas.

3,956,746

SUCCESSIVELY RANGED A/D CONVERTER WITH ERROR CORRECTION

Thomas K. Lisle, Jr., Baltimore; Jerome C. Beard, Pasadena, and Thomas W. Balma, Columbia, all of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 7, 1975, Ser. No. 539,133

Int. Cl.² H03K 13/02

U.S. Cl. 340—347 AD **1 Claim**

1. Apparatus for converting a bipolar analog input signal to a digital number output word composed of a total series of M digits, said apparatus comprising:

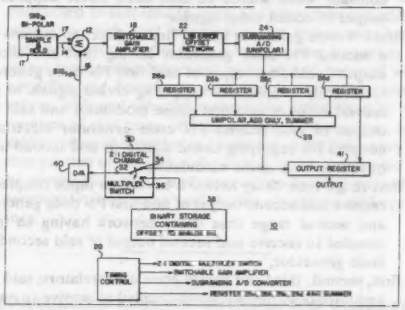
a. analog signal differential summing means having first and second inputs and operative to provide an output signal

representing the magnitude of signal applied to the first input less the magnitude of signal applied to the second input;

b. a subranging analog-to-digital (A/D) converter for converting an analog input signal of predetermined signal polarity into a subrange conversion word consisting of a digital number word having predetermined number, S, of digits, where S is less than M;

c. adjustable gain means, the output signal of the analog signal differential summing means being applied to the input of the subranging A/D converter through said adjustable gain means;

d. a digital summer having a series of digital summing elements in excess of S, and having at least one input associated with each summing element, said digital summer



being operative in response to a digital addend signal applied to one or more of its inputs to produce a digital sum word in the summing elements which is representative of the sum of the addend signal and the preexisting binary number word in the summing elements;

e. a digital-to-analog (D/A) converter for converting a digital number word to an analog signal, said D/A converter having its output connected to the second input of the analog differential summing means;

f. timing control means for iteratively actuating the subranging A/D converter to convert the analog signal present at its input upon each iterative actuation;

g. means for applying successively produced subrange conversion words to predetermined groups of inputs of the digital summer to combine them in such manner that each resultant successive digital sum word is a composite representation of the most significant bit subrange conversion and one or more lesser significant bit subrange conversion words with the digits of such successive subranges in the summing element positions which correspond to the appropriate subranges of the said series of M digits, said means for applying subrange conversion words operating in predetermined timed relationship to the operation to the timing control means;

h. means for shifting the voltage level of the bipolar analog input signal by a predetermined magnitude and polarity of shift to transform any bipolar analog input signal of a polarity other than said predetermined polarity into a signal of said predetermined polarity, said means for shifting the voltage level being operative only with respect to the initial subrange conversion performed by the subranging A/D converter;

i. means for applying each successively produced digital sum word in the summing elements of the digital summer to the input of the D/A converter in predetermined timed relationship to the operation of the timing control means such that the second subrange conversion, and successive subrange conversions thereafter, are performed upon the difference between the bipolar analog input signal and the analog equivalent of the digital sum word in the summing elements as the result of the next preceding subrange conversion;

j. means for varying the gain of the adjustable gain means in predetermined timed relationship to the operation of the timing control means to cause the subrange conversion words successively produced by the subranging A/D converter to be representative of the conversion of the residue of the bipolar analog input signal after previous subrange conversions are subtracted therefrom; and

k. said means for shifting the voltage level of the bipolar analog input signal comprises a means for applying a binary number word representing a predetermined numerical value to the input of the D/A converter prior to the first subrange conversion.

3,956,747

RADAR SYSTEM COMPRISING A PRIMARY RADAR DEVICE AND A SECONDARY RADAR DEVICE

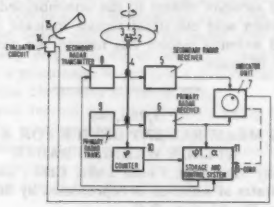
Dieter Leypold, and Bruno Maier, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Oct. 23, 1974, Ser. No. 517,221

Claims priority, application Germany, Oct. 25, 1973, 2353503

Int. Cl.² G01S 9/56

U.S. Cl. 343—6 R **15 Claims**



1. In a radar system of the type including a rotating antenna, a primary radar comprising a primary radar transmitter and a primary radar receiver having a doppler evaluation device operating according to the doppler effect and a secondary radar including means for providing a rotating antenna lobe, and in which a processing time elapses between scanning of the target by the lobe of the primary radar and the recognition of the target during target evaluation in the receiver of the primary radar, the improvement comprising:

a storage device connected to the primary radar receiver for storing azimuth angle data of a target; and

a control device connected to said storage device and to the secondary radar for causing triggering of interrogation signals by the secondary radar for an interrogation range α only when the secondary radar lobe repeatedly approaches the target, said control device including means for triggering over the range α so that a large number of answer signals is triggered sufficient for a predetermined reply probability.

3,956,748

OMNIDIRECTIONAL TRACKING WEAPON CONTROL SYSTEM

William H. Rymes, Arlington, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 29, 1972, Ser. No. 321,482

Int. Cl.² G01S 9/02

U.S. Cl. 343—7 A **9 Claims**

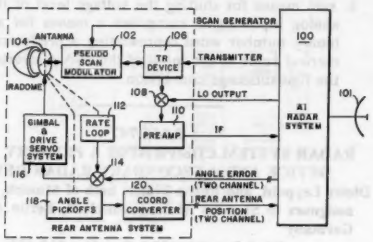
1. A radar system comprising:

a first antenna system capable of viewing a first region of space;

a second antenna system capable of viewing a second region of space;

a radar transmitter-receiver; and,

means for selectively connecting said transmitter-reciver to the antenna systems;



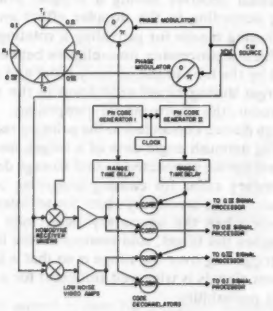
each of said antenna system including means for generating electrical signals representative of the azimuth and elevation position of the antennas; and said means for selectively connecting said transmitter-receiver to the antenna systems including means for receiving said electrical signals and for switching the connection from the connected antenna system to the unconnected antenna system when said electrical signals indicate that the connected antenna system has neared the periphery of its region of space.

3,956,749

BEARING MEASUREMENT DEVICE FOR A PORTABLE ATTACK WARNING RADAR

William Ray Magorian, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 16, 1973, Ser. No. 351,727
Int. Cl.² G01S 9/52
U.S. Cl. 343—16 R **1 Claim**



1. A bearing measurement device for a pseudo-random noise radar system comprising:

at least first and second oppositely facing receiving antennas;

at least first and second oppositely facing transmitting antennas;

said transmitting antennas being located orthogonally with respect to said receiving antennas;

a constant wave source supplying first and second output signals;

first phase modulator having first and second inputs and an output and second phase modulator having first and second inputs and an output;

said first output signal of said constant wave source being coupled to said first input of said first phase modulator and said first input of said second phase modulator, said output of said first phase modulator supplying signals to at least said first transmitting antenna, said output of said second phase modulator supplying signals to at least said second transmitting antenna;

a first homodyne receiver mixer coupled to receive signals from said first receiving antenna and a second homodyne receiver mixer coupled to receive signals from said second receiving antenna, each of said first and second homodyne receiver mixers additionally coupled to receive a reference signal from said second output of said constant wave source so that each mixer supplies an output of coded video signals;

first PN code generator having first and second outputs and a second PN code generator having first and second outputs, said first output of said first PN code generator electrically coupled for supplying coded signals to said second input of said first phase modulator and said first output of said second PN code generator electrically coupled for supplying coded signals to said second input of said second phase modulator;

first range time delay network having an input coupled to receive said second output of said first PN code generator and second range time delay network having an input coupled to receive said second output of said second PN code generator,

first, second, third and fourth code decorrelators; said first and third code decorrelators coupled to receive an output from said second range time delay network and said second and fourth code decorrelators coupled to receive an output from said first range time delay network;

first low noise video amplifier coupled between said first homodyne receiver mixer and said third and fourth code decorrelators for comparing the output of said first homodyne receiver mixer in said third and fourth code decorrelators for providing signal outputs to quadrant four and one signal processors, respectively; and

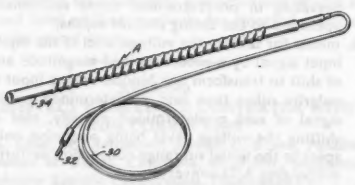
second low noise video amplifier coupled between said second homodyne receiver mixer and said first and second code decorrelators for comparing the output of said second homodyne receiver mixer in said first and second code decorrelators for providing signal outputs to quadrant three and two signal processors, respectively.

3,956,750

PORTABLE ANTENNA FOR USE WITHIN A VEHICLE

Warren S. Jones, 737 N. Seward St., Los Angeles, Calif. 90038

Filed Jan. 7, 1974, Ser. No. 431,092
Int. Cl.² H01Q 1/32
U.S. Cl. 343—712 **4 Claims**



1. In combination with a metallic automotive body having openings therein, said body functioning as a primary antenna to receive radio signals having a frequency which falls within the range of VHF High, VHF low and UHF signals, and re-radiating said radio signals, a device adapted for mounting within said automotive body proximate said openings which is

capable of receiving radio signals within a selected range of frequencies that emanate from said body as the latter serves as said primary antenna and directs said radio signals within said selected range to a radio of the scanner type disposed within said automotive body, said device including:

a. single elongate tubular rigid member formed from an electrical insulating material that may be disposed adjacent to, but spaced from an interior surface of said metallic automotive body;

b. a length of wire wound upon said rigid member to define a plurality of longitudinally spaced turns thereon, which length of wire has first and second ends that are secured to said elongate rigid member;

c. a lead-in cable connected to said radio, which cable has a known impedance;

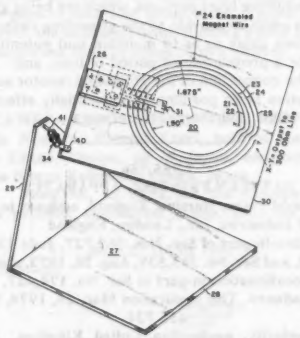
d. an inductance coil disposed within said member and connected to said lead-in cable and to said second end of said wire, with said impedance and inductance being matched, which radio when turned to the frequency of signals emanating from said body to said turns of wire amplifies and fransforms said signals to audible sound waves, with said selected range being determined by the number of said turns of wire on said rigid member, and said number of turns being increased as the frequency of that portion of the said radio signals which are desired to be received increases, and removable attaching means for removably positioning said device proximate said openings.

3,956,751

MINIATURIZED TUNABLE ANTENNA FOR GENERAL ELECTROMAGNETIC RADIATION AND SENSING WITH PARTICULAR APPLICATION TO TV AND FM

Julius Herman, 3906 Bel Pre Road, Silver Spring, Md. 20906

Filed Dec. 24, 1974, Ser. No. 536,168
Int. Cl.² H01Q 1/36
U.S. Cl. 343—744 **19 Claims**



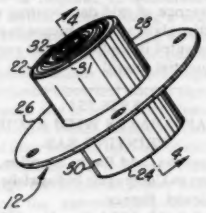
1. An antenna comprising a plurality of arcuate conductive segments disposed in a spiral loop configuration, each segment having first and second ends, the first end of a first segment and the first end of a second segment forming antenna termination points, impedance means serially connected between a pair of said segments and selectively actuable multi-position switch means for electrically interconnecting selected segments and the impedance means.

3,956,752

POLARIZATION INSENSITIVE LENS FORMED OF SPIRAL RADIATORS

Harry Richard Phelan, Indialantic; Kenneth M. Jagdmann, and Conrad Henry Ottenhoff, both of Melbourne, all of Fla., assignors to Harris Corporation, Cleveland, Ohio

Filed Mar. 12, 1975, Ser. No. 557,585
Int. Cl.² H01Q 1/36
U.S. Cl. 343—754 **12 Claims**



1. An antenna lens for receiving and reradiating electromagnetic energy comprising:

first and second spaced apart antenna elements for respectively receiving and reradiating electromagnetic energy;

each said element comprising an even pair of electrically conductive spiral arms spaced from each other, said arms having a common axis of rotation, each said arm having inner and outer arm ends, said inner arm ends being rotationally displaced about said axis relative to each other by a given angle to achieve a given rotational phase progression about said common axis;

said first and second antenna elements being of opposite geometric winding sense; and

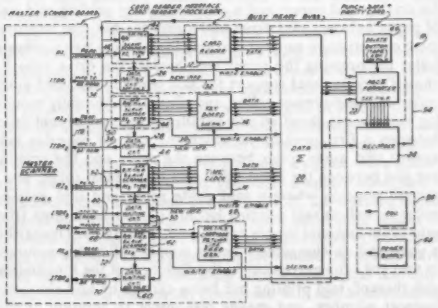
transmission means including a plurality of conductors each interconnecting a said arm of said first element with an associated arm of said second element.

3,956,753

DATA COLLECTING SYSTEM

Albert L. Armstrong, Latham; Paul E. Bakeman, Jr., Elnora, both of N.Y.; Joel Woodhull, Los Angeles, Calif.; Wayne C. Taft, Troy, N.Y., and H. Norman Ketola, Stowe, Vt., assignors to RRC International, Inc., Latham, N.Y.

Continuation of Ser. No. 410,971, Oct. 29, 1973, abandoned. This application Feb. 20, 1975, Ser. No. 551,423
Int. Cl.² G01D 9/00
U.S. Cl. 346—34 **3 Claims**



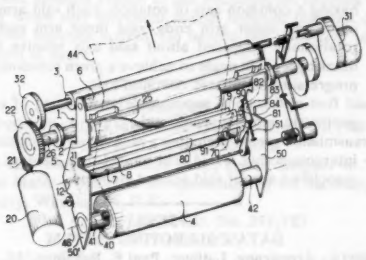
1. A data collecting system in which each entry of data activates the system to record that entry into a sequential record of occurrences for subsequent processing removed from the site of the occurrences comprising: time clock data generating means for generating a time representative first

information output signal; at least one additional data generating means adapted to generate an additional information output signal in response to said entry; each of said data generating means including circuit means for producing a data waiting signal independent of said information output signals when said information output signal is generated; removable record recording means; slave scanner means and master scanning means adapted to sequentially energize said slave scanner means for each of said data generating means, said master scanning means sequentially testing each of said circuit means for the presence of said data waiting signal, and energizing said respective slave scanner means in response thereto, whereby said data entry is applied to said recording means to produce said sequential record.

3,956,754
FACSIMILE APPARATUS WITH RECIPROCATING PRINTING BAR

Jacques Mary, Bagneux, and Pierre Merillou, Grigny, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, France

Filed July 30, 1974, Ser. No. 493,102
Claims priority, application France, Aug. 6, 1973, 73.28668
Int. Cl.² G01D *15/06*; H04N *1/16*
U.S. Cl. 346—74 E **8 Claims**

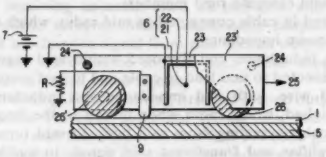


1. In a facsimile receiver having a frame carrying a drum provided with a printing helix, a supply roller for carrying a rolled web of paper and drive means including a drive roller for driving said paper; and a guide roller for guiding said web of paper between said drum and a printing bar; the improvement comprising a support carrying the printing bar; a presser-roller for pressing the paper web against the drive roller; a chassis carrying said support for said printing bar, said guide roller and said presser-roller; and means for pivotally mounting said chassis about an axis parallel to the axis of said drum between a first position in which the web of paper is held against said guide roller between the drum and the printing bar and between the drive roller and the presser-roller, and a second position wherein said guide roller and said presser-roller as well as said printing bar are positioned remote from said drum and said supply roller, said printing bar comprising a yoke and an elongated support member slideably mounted in said yoke for movement in the direction of the longitudinal axis thereof, said printing bar being carried by said elongated support member, and means responsive to rotation of said guide roller for reciprocating said elongated support member, said guide roller having a groove in the form of a closed loop in the surface thereof, and said means for reciprocating said elongated support member comprises a guide rod connected to said printing bar support and engaging said groove so as to reciprocate in the direction of the axis of said guide roller.

3,956,755
ELECTROSTATIC IMAGE FORMING METHOD AND APPARATUS WITH CONTROLLED DISCHARGE OF THE ORIGINAL MEMBER

Isoji Takahasi, and Seiji Matsumoto, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed June 25, 1974, Ser. No. 483,063
Claims priority, application Japan, Aug. 10, 1973, 48-89869
Int. Cl.² G03G *15/052*
U.S. Cl. 346—74 ES **11 Claims**



1. An eletrostatic latent image forming method comprising:
uniformly charging the surface of an electrostatic image forming member comprising both (1) surface portions each having an insulating surface and occupying the surface of an insulating support in a pattern-like manner and (2) raised layer portions each having a conductive surface and formed on the remaining areas of the surface of said insulating support, such that the conductive layer portions are electrically isolated from the earth;
grounding the surfaces of the charged conductive layer portions to the earth with a potential difference level being maintained which prevents a possible discharge from occuring between the conductive layer portions, which are being grounded and which are to be grounded, so as to remove the charges therefrom so that the charges in the surfaces of the insulating surface portions remain forming an electrostatic latent image;
said grounding being effecting by connecting a grounding resistor having a resistance of 10^6 to 10^9 ohms between the conductive layer portions, which are being grounded, and the earth to provide to the grounding circuit a sufficient time delay so as to maintain said potential difference for a predetermined period of time; and
moving the connection of the grounding resistor across said conductive layer portions to sequentially effect the removal of the said charges therefrom.

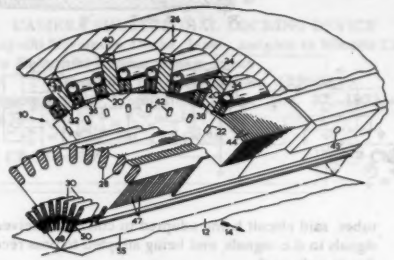
3,956,756
PATTERN PRINTING APPARATUS

Anthony David Paton, Harston, England, assignor to Imperial Chemical Industries, Inc., London, England

Continuation-in-part of Ser. Nos. 369,727, June 13, 1973, abandoned, and Ser. No. 389,539, Aug. 20, 1973, abandoned, which is a continuation-in-part of Ser. No. 174,427, Aug. 24, 1971, abandoned. This application Mar. 28, 1974, Ser. No. 455,724
Claims priority, application United Kingdom, Aug. 26, 1970, 40970/70; Oct. 3, 1970, 47113/70; June 30, 1972, 30794/72
Int. Cl.² G01D *15/18*
U.S. Cl. 346—75 **14 Claims**

1. Pattern printing apparatus for printing by depositing on a surface to be printed, during relative movement between the apparatus and the said surface, small drops of printing liquid in successive rows of contiguous and solid drops extending transversely to said direction of relative movement, comprising a plurality of rows of printing guns, means for mounting said guns with each row extending transversely to said direction of relative movement and with said rows extending arcuately in an array, and each gun having an orifice, printing liquid supply means for supplying printing liquid under pres-

sure to the orifices so that a gun in each row is included in a group of guns with each gun in the group forming a jet of printing liquid directed towards the same location in the apparatus of the said surface, all of the guns in a row of printing guns being supplied with the same colored printing liquid and each row of guns being supplied with a different colored printing liquid, means for imparting regularly spaced variations in the cross-section of the jet to stimulate drop formation, charge electrode means located adjacent the position in the jet path of drop separation to effect charging of drops formed in the jet path to a charge corresponding to a first voltage level or to a charge corresponding to any of a plurality of second voltage levels, drop deflection means for providing a substantially constant electrostatic field through which pass



the drops formed in the jet path thereby to deflect each electrically charged drop in a direction transverse to said direction of relative movement as a function of the charge level on that drop, drop intercepting means for intercepting those drops which have been charged to a charge corresponding to said first voltage level, and control circuit means responsive to pattern information signals for producing an electrical signal in the form of first or second voltage levels and applying the said signal to said charge electrodes, including means for applying the said signal to cause at most one of said charge electrodes of said guns of each said group to be charged to one of said second levels and the remaining charge electrodes of the other guns of each said group to be charged to said first voltage level, the deposited drops forming a solid line segment so that successive rows of drops form a pattern.

3,956,757
CAMERA EXPOSURE CONTROL CIRCUIT

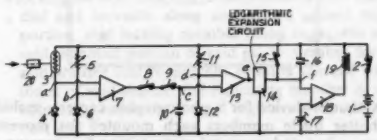
Katsuhiko Nomura; Hiroshi Kurei, both of Kawagoe, and Fumio Urano, Omiya, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Japan

Filed Dec. 18, 1973, Ser. No. 425,808

Claims priority, application Japan, Dec. 30, 1972, 48-458[U]

Int. Cl.² G03B 7/08

U.S. Cl. 354—51 **8 Claims**



1. In a camera having an automatic exposure control circuit and a manually operable means for energizing said circuit, light receiving means positioned internally of the camera for receiving light passing through an objective of the camera and for converting it into a corresponding first electrical quantity, diaphragm information means for producing a second electrical quantity corresponding to the setting of the diaphragm, operational amplifier means connected electrically with said light receiving and diaphragm information means for combining said first and second electrical quantities and for providing therefrom a combined electrical output signal for use in contributing partly to determination of exposure time, capacitor means for storing said combined electrical output signal, and normally closed manual and automatic switch means for assuming an open position, after energizing of said automatic exposure control circuit by said manually operable means, either in response to manual opening of said normally closed switch means or in response to automatic opening of said normally closed switch means during a sequence of camera operations in connection with making an exposure, said normally closed switch means being interconnected between said operational amplifier means and said capacitor means for causing said combined electrical output signal to be stored in said capacitor means and to be retained thereby upon opening of said normally closed switch means either manually or automatically, so that after manual opening of said normally closed switch means a diaphragm of the camera can have its setting changed to change the actual exposure made by the camera without changing the automatically determined exposure time.

3,956,758
WARNING DEVICE FOR PHOTOGRAPHIC CAMERAS

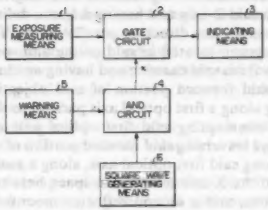
Saburo Numata, Urawa; Iwao Sagara, Higashikurume, and Hirohisa Shishikura, Kodaira, all of Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya and Oki Electric Industry Company, Ltd., Tokyo, both of, Japan

Filed July 29, 1974, Ser. No. 492,879

Claims priority, application Japan, July 28, 1973, 48-85169

Int. Cl.² G03B 17/20

U.S. Cl. 354—53 **8 Claims**



1. In a camera wherein exposure information is indicated by use of light emitting means located in the viewfinder and connected with an exposure measuring means, a warning device for indicating a warning in the viewfinder by use of said light emitting means comprising a warning situation detecting means which detects a situation that needs a warning and a warning signal generating means connected with said detecting means which generates a warning signal of level 1 when a warning situation is detected by said detecting means and normally generates a signal of level 0 when a warning situation is not detected by said detecting means, a square wave generating means which constantly generates a square wave, and a logical multiplying circuit connected with the warning signal generating means and the square wave generating means to generate an output of the logical multiplication of the signal from the warning signal generating means and the square wave from the square wave generating means, said logical multiplying circuit being electrically connected with said light emitting means to intermittently deenergize the latter by the output thereof, whereby the light emitting means is intermittently deenergized at a frequency corresponding to the frequency of the square wave when the warning signal is generated from the warning signal generating means, said frequency being sufficiently low to permit the photographer viewing through the

viewfinder to notice the intermittent deenergization of the light emitting means in the viewfinder.

3,956,759

COMPACT SINGLE LENS REFLEX CASSETTE CAMERA

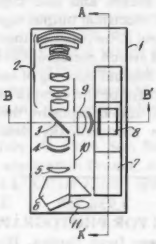
Tohru Karikawa, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 15, 1974, Ser. No. 497,604

Claims priority, application Japan, Aug. 21, 1973, 48-97246[U]

Int. Cl.² G03B *19/12*

U.S. Cl. 354—150 **6 Claims**



1. The combination of a cassette type camera and a film carrying cassette comprising a casing having a longitudinally extending Z-axis, a film cassette replaceably housed in said casing and extending longitudinally thereof and including at longitudinally spaced opposite ends thereof enlarged film storing sections connected by a film guide section, guiding film between said storing sections in a longitudinal direction parallel to said Z-axis and having a frame delineating window facing inwardly in a direction parallel to the Y-axis, an objective lens system located in said casing and spaced a distance the X-axis from said cassette and having an elongated forward portion, said forward portion of said objective lens system extending along a first optical axis parallel to the Z-axis, a first reflector intercepting said first optical axis and oriented to deflect rays traversing said forward portion of said optical lens system along said first optical axis, along a second optical axis parallel to the X-axis toward the space between said cassette end sections, and a second reflector mounted in said casing between said cassette end sections and oriented to deflect the rays deflected by said first reflector thereto along a third optical axis parallel to the Y-axis to said cassette window, said X, Y and Z axes being mutually perpendicular.

3,956,760

LIQUID LEVEL GAUGE

Harrison F. Edwards, Norwich, N.Y., assignor to Liquidometer Corporation, Norwich, N.Y.

Filed Mar. 12, 1975, Ser. No. 557,850

Int. Cl.² G01F *23/24, 23/26*; G08B *21/00*

U.S. Cl. 340—244 C **13 Claims**

1. A device for indicating the presence or absence of either dielectric or conductive liquids at substantially a single level in a tank, comprising in combination:

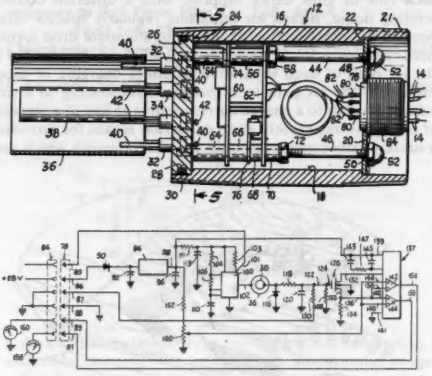
a. signal generating-means for producing an a.c. signal on an output line,

b. means providing a signal of substantially constant potential level on said output line,

c. an immersion probe comprising substantially concentric inner and outer, insulatedly-mounted conductive tubes, one of said tubes being connected to receive signals from said output line, said probe being adapted to couple an a.c. signal when immersed in a dielectric liquid, and to couple a d.c. signal when immersed in a conductive liquid,

d. means for selecting one or the other of said signals to be operable on the output line,

e. a rectifier and filter circuit having input terminals connected to receive signals produced in the other of said



tubes, said circuit being adapted to convert received a.c. signals to d.c. signals, and being adapted to pass received d.c. signals, and

f. an indicator device responsive to signals from said rectifier and filter circuit.

3,956,761

SHUTTER DEVICE FOR A PHOTOGRAPHIC CAMERA

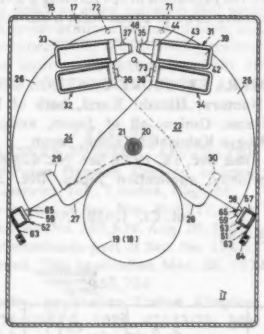
Carl Koch, Stetten, and Karl Gfeller, Schaffhausen, both of Switzerland, assignors to Sinar AG Schaffhausen, Feuerthalen, Switzerland

Filed July 17, 1974, Ser. No. 489,089

Claims priority, application Switzerland, July 19, 1973, 10558/73

Int. Cl.² G03B *9/10*

U.S. Cl. 354—255 **13 Claims**



1. A shutter device for a photographic camera, including two shutter blade members each mounted for movement between a first and a second rest position for opening and closing a camera aperture, first drive devices mounted on said camera and being operatively associated with each of said shutter blade members for moving said blade members during an exposure sequentially and at a time interval, in the same direction, from the first rest position to the second rest position, and second drive devices mounted on said camera and being operatively associated with each of said shutter blade members for returning moving said blade members during a

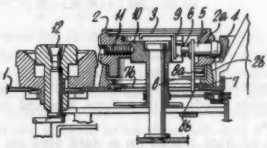
subsequent exposure sequentially and at a time interval, in an opposite direction, from the second to the first rest position, each of said shutter blade members being mounted in place for free rotation movement, and each of said drive devices including a percussion armature having a striker means mounted at one end thereof, said drive devices functioning with an associated shutter blade member via said striker means in such a manner that said shutter blade members are movable from the first to the second rest position, and vice versa, by means of the percussion armature of said drive devices, through sudden acceleration and subsequent free travel.

3,956,762

CAMERA SHUTTER DIAL LOCKING DEVICE

Takayoshi Miyamoto, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 12, 1974, Ser. No. 523,081
Claims priority, application Japan, Nov. 27, 1973, 48-135675
Int. Cl.² G03B 17/00
U.S. Cl. 354—289 7 Claims



1. In an automatic exposure camera including a camera body, a shutter dial and a rotatable shutter setting shaft, a device for locking the shutter dial comprising:

a fixed index located on the camera body;

a hollow shutter dial including a peripheral portion and a shutter dial indicating member having an index designating automatic exposure control and indicia designating manual exposure control values which are movable into registry with said fixed index, said shutter dial being mounted on and rotatable with said shaft and disposed outwardly of the camera body;

a non-rotatable guide member including an arcuate guide portion having an indented portion formed therein in a radial direction relative to said shutter dial, located in said shutter dial and fixed to the camera body;

a locking member coupled to and rotatable with said shutter dial and movable along and biased against said guide portion, said locking member being engagable said with said indented portion of said guide member for locking said shutter dial to prevent rotation thereof when said index of said shutter dial indicating member designating automatic exposure control registers with said fixed index; and

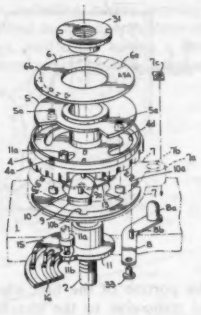
a release member within said shutter dial movable along a path extending beyond said peripheral portion of said shutter dial and biased so that an end portion of said release member projects outwardly of said peripheral portion, said release member being coupled to said locking member so that said locking member is disengaged from the indented portion of said guide member to release said shutter dial and permit rotation thereof when said release member is pushed against its bias.

3,956,763

FILM SENSITIVITY SETTING DEVICE

Akira Yamanaka, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Japan

Filed May 21, 1975, Ser. No. 579,573
Claims priority, application Japan, May 25, 1974, 49-59903
Int. Cl.² G03B 17/00
U.S. Cl. 354—289 15 Claims



1. A film sensitivity setting device for use in a photographic camera of the type having an automatic exposure control device to which a signal representative of film sensitivity is provided by the setting device, the setting device comprising:

a member manually operable for setting a film sensitivity value;

a lock member;

coupling means for integrally coupling said manual member with said lock member so that said manual and lock members move together as an integral unit, said coupling means being normally engaged with said lock member for effecting such coupling, and said coupling means being disengaged by manual operation from said lock member for enabling said manual member to move independently of said lock member;

means for locking said lock member at each position corresponding to a film sensitivity value to be set by said manual member;

means for releasing said locking means to permit movement of said lock member together with said manual member; and,

an indicating member having at least one first indicia and said manual member having at least one indicia disposed for cooperating with said first indicia for indicating a derivation of exposure in coordination with the movement of said manual member relative to said lock member.

3,956,764

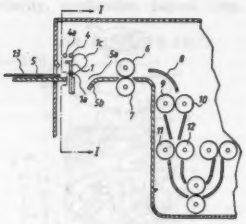
DEVICE FOR DETECTING THE PRESENCE OF PHOTOGRAPHIC FILM AS THE FILM TRAVELS ALONG A PREDETERMINED PATH THROUGH A FILM PROCESSING APPARATUS

Helmut Schausberger, Unterhaching, Germany, assignor to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Nov. 1, 1974, Ser. No. 520,202
Claims priority, application Germany, Nov. 8, 1973, 2355920
Int. Cl.² G03D 13/00
U.S. Cl. 354—298 15 Claims

1. In an apparatus for processing photographic film and the like, transport means operative for guiding and transporting a photographic film along a predetermined path of travel; a flap structure mounted for pivoting movement about a pivot axis between a rest position in which said flap structure blocks said path of travel and a work position in which said flap structure

does not block said path of travel, said flap structure being so disposed as to be displaced to and maintained in said work position by film being transported along said path by said transport means, said pivot axis being oriented parallel to the



surface of the portion of the film which engages said flap structure and transverse to the direction of travel of said portion of the film; and detecting means operative for indirectly detecting the travel of film along said path by detecting pivotal displacement of said flap structure.

3,956,765

INTEGRATED SEMICONDUCTOR ARRANGEMENT

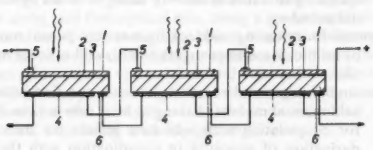
Horst Fischer, Heilbronn, and Willi Pschunder, Flein, both of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Oct. 24, 1973, Ser. No. 411,461

Claims priority, application Germany, Nov. 3, 1972, 2253830

Int. Cl.² H01L 27/14

U.S. Cl. 357—30 **9 Claims**



1. A solar cell battery comprising a plurality of series connected integrated semiconductor arrangements with each of said integrated semiconductor arrangements comprising: a solar cell including a semiconductor body of a first conductivity type having a region of the opposite conductivity type adjacent one major surface thereof and forming the pn-junction of the solar cell, a front side contact for said solar cell ohmically contacting said region of opposite conductivity type on said one major surface, and a rear side contact for said solar cell ohmically contacting the opposite major surface of said semiconductor body; and a rectifying metal-semiconductor contact on one of said major surfaces and contacting said semiconductor body; and

wherein, in each case, the rear side contact of one integrated semiconductor arrangement is connected to the front side contact of the subsequent integrated semiconductor arrangement and the metal-semiconductor contact of one integrated semiconductor arrangement is connected to the rear side contact of the subsequent integrated semiconductor arrangement.

3,956,766

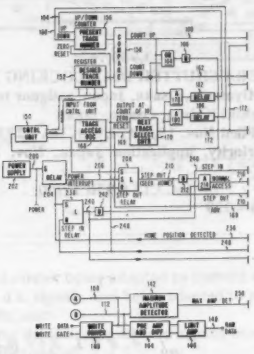
COUNTER RESETTING CIRCUITRY FOR MAGNETIC DISK SYSTEM

Charles Christian Hanson, and Francis Kong King, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 25, 1974, Ser. No. 526,666

Int. Cl.² G11B 21/08

U.S. Cl. 360—78 **5 Claims**



1. Movement controlling apparatus including:

a moveable medium of a type adapted to carry record tracks,

a series of data tracks on a data area on said moveable medium and a prewritten reference track on said moveable medium located on one edge of said data area,

a sensor moveably mounted so as to cross said medium and providing an output signal as a result of the sensor crossing said reference track,

motor means responsive to signal including pulses applied thereto for moving said sensor across said medium for a distance depending on the number of pulses supplied to said motor means,

a source of pulses,

first control means for connecting said source of pulses with said motor means in such a manner that said sensor is moved in a first direction from said data area toward said reference track,

second control means for connecting said source of pulses with said motor means in another and in such manner so as to move said sensor in a second or opposite direction,

means for keeping track of the number of pulses applied to said motor means from said pulse source and including a counter for thereby maintaining a count in the counter which is indicative of the position of said sensor on said moveable medium,

means for so controlling said two control means so that said motor means is effective to move said sensor in said first direction across said reference track and then reverse the motion of said sensor so that it recrosses said reference track moving in said second direction and toward said data area of said moveable medium,

means connected with said sensor and connected with said counter so as to be responsive to the signal from said sensor as it recrosses said reference track in moving in said second direction toward said data area to thereby reset said counter and thereby initialize said counter so that the counter is effective to indicate the position of tracks in said data area,

a desired track number register having a content corresponding to any one of said data tracks on said data area,

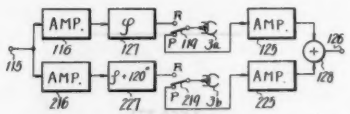
a compare circuit having the outputs of said counter and said register applied thereto and having an output according to the difference between the contents of said counter and register, and

means connecting the output of said compare circuit with said motor means and with said two control means for causing said motor means to drive said sensor in either said first direction or in said second direction to different data tracks in said data area.

3,956,767
SIGNAL RECORDING AND/OR REPRODUCING APPARATUS WITH PHASE SHIFTING TO REDUCE SIGNAL AMPLITUDE AT OVERLAP POINTS

Keisuke Machida, Yokohama, and Katsuichi Tachi, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 5, 1974, Ser. No. 530,002
Claims priority, application Japan, Dec. 8, 1973, 48-139745
Int. Cl.² G11B *15/14, 15/12*
U.S. Cl. 360—22 **10 Claims**



1. An apparatus for recording and reproducing a signal on a record medium, comprising a plurality of transducers successively scanning the record medium in a repeated cyclic order for respective scanning intervals which have overlapping periods; recording circuit means including an input terminal for receiving a signal to be recorded, and a plurality of channels extending from said input terminal and being operative, during a recording operation of the apparatus, to transmit the signal from said input terminal to said transducers, respectively, for sequential recording by said transducers on the record medium during said respective scanning intervals; reproducing circuit means including an output terminal for delivering a reproduced signal, a plurality of channels operative, during a reproducing operation of the apparatus, to transmit the signals reproduced sequentially by said transducers, respectively, from the record medium during said respective scanning intervals, and combining means for combining the sequentially reproduced signals transmitted by said channels of the reproducing circuit means to provide a combined reproduced signal at said output terminal; and phase-shifting means in one of said recording and reproducing circuit means for phase-shifting, by 120°, the signal transmitted through one of said channels of said one circuit means relative to the signal transmitted through at least another of said channels of said one circuit means, whereby to avoid level increases in said combined reproduced signal as a consequence of said overlapping periods of the scanning intervals.

3,956,768
VIDEOTAPE CASSETTE AUTOMATIC LOADER-UNLOADER

Edward L. Covington, 510 N. Sheridan, Tulsa, Okla. 74115

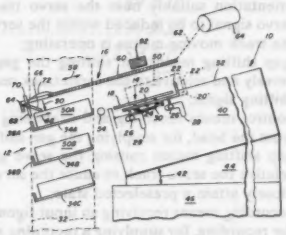
Filed Oct. 29, 1974, Ser. No. 518,411
Int. Cl.² G11B *15/68, 23/04*
U.S. Cl. 360—92 **15 Claims**

1. A videotape cassette automatic loader-unloader system adapted to load cassettes into a videotape deck, from a shelf means and to unload said cassettes from said deck to said shelf means, said videotape deck having an elevator plate means onto which a cassette is placed and means to depress said elevator plate a selected distance to cause the tape in said cassette to be played, the improvement in means to load a cassette from said shelf means to said deck and unload said cassette from said deck to said shelf means comprising:

a. means to support said deck at a selected small tilt angle to the horizontal said tilt being upward from the edge of said deck adjacent said shelf means;

b. vertically positionable shelf means in front of said elevator plate means of said videotape deck, the top surface of said shelf means substantially coplanar with the top surface of said elevator plate means, a cassette in loading position on said shelf means;

c. loading means including means moving substantially parallel to said tilted deck to exert a force on said cassette at its back edge, said force having a first component parallel to the plane of said cassette, adapted to force said



cassette in a forward direction along the surface of said shelf means onto the top surface of said elevator plate, and a second component substantially perpendicular to the plane of said cassette adapted to force said cassette downward;

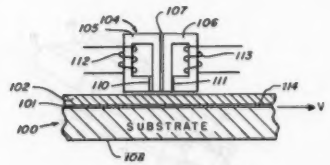
whereby said loading means will slide said cassette across said shelf onto said elevator plate, and moving farther, will extend an ejection means permitting the elevator plate to drop and position the cassette in the deck; and

d. means to lift said elevator plate means and means to eject said cassette along the surface of said elevator plate means, whereby said cassette will be ejected horizontally from said elevator plate means, and will slide to said shelf means by gravity.

3,956,769
RECORDING SYSTEM HAVING COINCIDING SERVO AND DATA TRACKS

Harold James Beecroft, Minneapolis, Minn., and Srinivasan Venkata Chari, Foster City, Calif., assignors to Control Data Corporation, Minneapolis, Minn.

Filed Aug. 12, 1974, Ser. No. 496,509
Int. Cl.² G11B *21/10, 5/66*
U.S. Cl. 360—77 **4 Claims**



3. A magnetic recording system comprising

a. a magnetic recording medium comprised of a substrate having a transcribing surface, an inner magnetic recording layer affixed to the transcribing surface, and an outer magnetic recording layer affixed to the inner, the coercivities of the two layers being sufficiently different to permit alteration of the magnetic pattern in the lower coercivity layer without affecting the pattern in the other, and the

higher coercivity layer having at least one servo track recorded therein;

b. means for supporting the medium and for causing the entire length of the servo track to move relative to a fixed transcribing point;

c. a transducing head having a servo signal flux path containing a servo gap intersecting a recording face, and a servo winding producing a servo signal varying with distance of the servo gap from the servo track when the recording face is placed in a transcribing orientation adjacent the outer layer, and a data signal flux path having a data gap substantally longer than the servo gap intersecting the recording face at a preselected position relative to the servo gap, and a data winding;

d. a head support supporting the head in the transcribing orientation suitably near the servo track to cause the servo signal to be induced within the servo winding while the track moving means is operating;

e. gap shifting means for shifting the gap position transversely and relative to the servo track responsive to a gap shifting signal;

f. control means receiving and examining the servo signal from the head, for supplying the gap shifting signal to the gap shifting means causing the servo gap to be shifted relative the servo track to cause the servo signal to more closely attain a preselected state;

g. recording means receiving an input signal containing data for recording, for supplying a recording signal to the head causing the data in the input signal to be recorded in the lower coercivity layer of the medium with a pulse density at least 10 times lower than the servo signal without affecting the recorded servo tracks in the higher coercivity layer; and

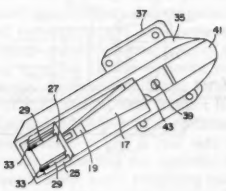
h. playback means for producing when the data gap is withing a preselected distance of the data track, a data playback signal within the data winding encoding data recorded in the data track.

3,956,770

CONTACT START-STOP SELF-ELEVATING AIR SUPPORTED MAGNETIC RECORDING HEAD

George G. McWhinnie, Lederach, and Joseph P. Pomian, King of Prussia, both of Pa., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Aug. 26, 1974, Ser. No. 500,241
Int. Cl.² G11B *5/60*
U.S. Cl. 360—103 **5 Claims**



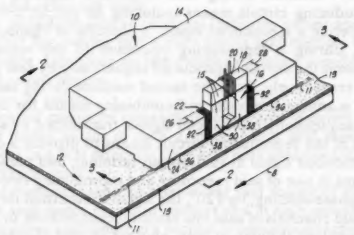
1. A flying head device for locating magnetic transducer means in close proximity to a movable magnetic recording medium when it is moving comprising in conbination: a housing means having upper and lower bases and formed to have a pair of runner-like protrusions extending from said lower base; said housing having a width of x inches and a length of y inches whereby said lower base is xy square inches; each of said protrusions formed to have a very narrow width and a length which is approximately equal to y whereby the area of the lower surface of each protrusion is in the range of .014 to .034 of said xy square inches; said protrusions each further formed to have a leading section and a trailing section with said leading section formed to have a slight curvature upward to enable air to wedge thereunder in the event air is moved toward said leading section; bearing means mounted on said upper base of said housing means; a pair of magnetic transducer means with one each mounted in a different one of said trailing sections of said protrusions; flexure means mounted to a fixed means and disposed to locate said housing means over said movable magnetic recording medium; and bias spring means secured to said flexure means and formed to fit over said bearing means to thereby locate said housing means over said movable magnetic recording medium whereby when said movable magnetic recording medium is moved under said protrusions said housing means will be lifted until said bearing means abuts said flexure means.

3,956,771

MAGNETIC TRANSDUCER WITH SIDE MOUNTED FERRITE CORE AND METHOD OF MAKING THE SAME

James L. Barnes, Guthrie, and Jack L. Doan, Mustang, both of Okla., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Mar. 3, 1975, Ser. No. 554,943
Int. Cl.² G11B *5/14, 5/60, 5/221*
U.S. Cl. 360—127 **5 Claims**



1. A magnetic transducer for recording and readout of data on a moving magnetic storage medium comprising: a slider having a notch along one side thereof, a ferrite core mounted within said notch so as to be enveloped on three sides by said slider and leaving one side surface exposed, said core being bonded to said slider and having a width dimension perpendicular to the direction of motion of said storage medium in the vicinity of said core, the bottom surfaces of said core and of said slider jointly presenting a co-planar surface to said storage medium, a transducer gap traversing the width dimension of said bottom core surface, a portion of said exposed core side surface being beveled inwardly to reduce the width of said core bottom surface below the minimum machined width obtainable without the support of said enveloping slider, said core further extending above said slider, and a read-write coil coupled to said extension of said core.

DESIGN PATENTS

GRANTED MAY 11, 1976

ERRATA

For CLASS	See PATENT NO.
025-074	239,808
025-033	239,826
025-089	239,827
016-001	239,872
016-014	239,873
016-015	239,874

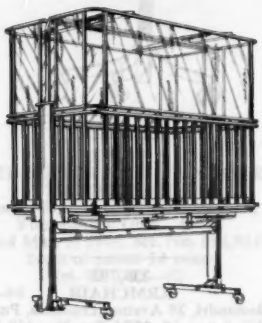
DESIGNS

MAY 11, 1976

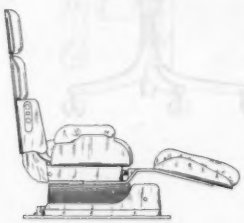
239,787
EAR CAP FOR AUDITORY PROTECTION
Bo Gunnar Lonnstedt, Kvarnbergsvagen 23, S–141 45 Huddinge, Sweden
Filed Apr. 16, 1974, Ser. No. 461,422
Claims priority, application Sweden Oct. 16, 1973
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—259

239,788
ARM GARMENT
Jeanne M. Allaway, La Grange, Ill. (% Davis, McCaleb and Lucas, 230 W. Monroe St., Suite 2040, Chicago, Ill. 60606)
Filed July 29, 1974, Ser. No. 492,549
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—452

239,789
PEDIATRIC CRIB
Stuart N. Mann, Derby, N.Y., assignor to John F. Hurley, Scituate, Mass.
Filed Oct. 31, 1974, Ser. No. 519,411
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—16



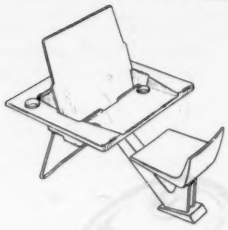
239,790
DENTAL CHAIR
Ronald C. Webb, Red Lion, Pa., assignor to Dentsply Research & Development Corp., Milford, Del.
Filed Dec. 17, 1974, Ser. No. 533,733
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—22



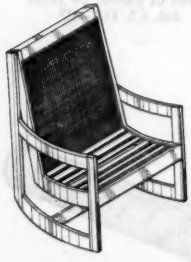
239,791
TYPIST CHAIR
Marc Alessandri, 29 Avenue Trudaine, Paris, France
Filed Apr. 12, 1974, Ser. No. 460,435
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—30

239,792
ARMCHAIR
Marc Alessandri, 29 Avenue Trudaine, Paris, France
Filed Apr. 12, 1974, Ser. No. 460,426
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31

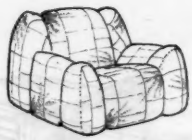
239,793
COMBINED DESK AND CHAIR
Ralph Godfrey Jones, Sandhills Cottage Farm, Newtown Linford, England
Filed Oct. 1, 1973, Ser. No. 402,016
Term of patent 14 years
Int. Cl. D6—*05*
U.S. Cl. D6—42



239,794
ROCKING CHAIR
Richard Morse Chapin and Hamlin Taylor Haynes, Charlotte, N.C., assignors to Paoli Chair Company, Inc., Paoli, Ind.
Filed Aug. 5, 1974, Ser. No. 495,049
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—49



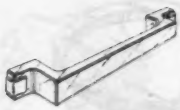
239,795
SEAT
Charles Bernard, Montreuil-sous-Bois, France, assignor to Airborne S.A.
Filed Feb. 27, 1974, Ser. No. 446,336
Claims priority, application France Sept. 5, 1973
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—71



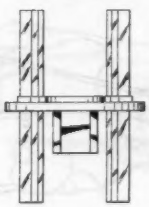
239,796
DISPLAYER FOR A FINGER RING
John R. Williams, Indianapolis, Ind., assignor to Mahan Co. Inc., Indianapolis, Ind.
Filed June 28, 1974, Ser. No. 484,288
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—85

239,797
TIRE RACK
Emanuel J. Zinna, 28 Holly Drive, Sayville, N.Y. 11782
Filed May 22, 1974, Ser. No. 472,123
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—85

239,798
BATHTUB GRAB BAR
Guy Vrignaud, Grenoble, France, assignor to Allibert Exploitation Societe Anonyme, Puteaux, France
Filed Nov. 6, 1974, Ser. No. 521,489
Claims priority, application France May 6, 1974
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—85



239,799
COMBINED SUPPORT AND CONTAINER FOR TOOTHBRUSHES
Charles S. Fentules, 15 Illinois Ave., Youngstown, Ohio 44505
Filed Mar. 3, 1975, Ser. No. 554,914
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—94

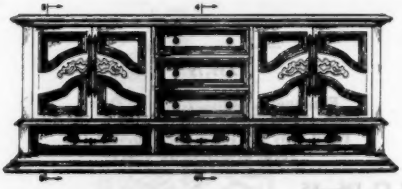


239,800
TABLE
Keith McDonald Roberson, Mecklenburg, N.C., assignor to Crowell-Roberson, Inc.
Filed Oct. 24, 1974, Ser. No. 517,503
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—146

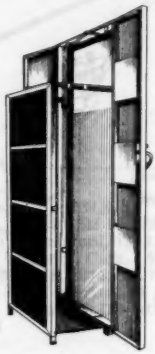
239,801
DESK
Robert J. Szucs, Midlothian, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Oct. 31, 1974, Ser. No. 519,477
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—161

239,802
DESK
Robert J. Szucs, Midlothian, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Oct. 31, 1974, Ser. No. 519,478
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—161

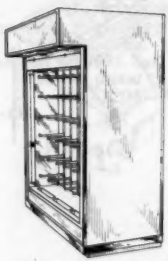
239,803
DRESSER OR THE LIKE
Huey T. Keller, High Point, N.C., assignor to Empire Furniture Corporation, Johnson City, Tenn.
Filed Apr. 17, 1972, Ser. No. 245,029
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—164



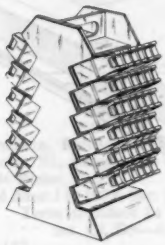
239,804
FILING CABINET
Kurt Bonnie Karl Axel Lundberg, Malarvagen 1, Box 5021, 141 05 Huddinge, Sweden
Filed June 7, 1974, Ser. No. 477,238
Claims priority, application Great Britain Dec. 19, 1973
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—168



239,805
SUPERMARKET PRODUCE DISPLAY FIXTURE
Louis E. South, Kansas City, Mo., assignor to The Weather Box Company, Kansas City, Mo.
Filed Mar. 26, 1975, Ser. No. 562,343
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—187

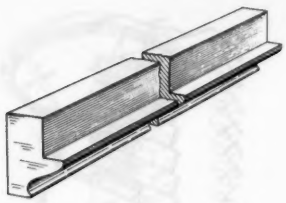


239,806
COMBINED DISPLAY RACK AND MERCHANDISE HOLDERS
Tony J. Bressickello, 13015 S. Normandi Blvd., Gardena, Calif. 90249
Filed Mar. 4, 1975, Ser. No. 555,178
Term of patent 14 years
Int. Cl. D6—*04*; D20—*02*
U.S. Cl. D6—188

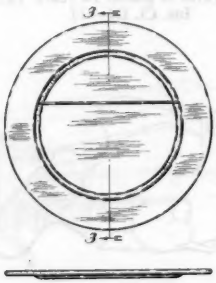


239,807
BATHTUB TREAD
Thomas J. Nelson, 1772 Orizaba Ave., Apt. 7, Long Beach, Calif. 90804
Filed Sept. 17, 1973, Ser. No. 398,008
Term of patent 14 years
Int. Cl. D6—*11*
U.S. Cl. D6—211

239,808
PICTURE FRAME MOULDING
Johannes Vihma, Toronto, Ontario, Canada, assignor to Artistic Woodwork Co. Ltd., Downsview, Ontario, Canada
Filed Nov. 7, 1974, Ser. No. 521,731
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D25—74

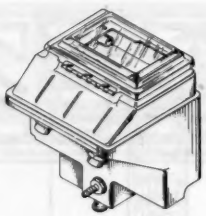


239,809
COMPARTMENTED PLATE
Theodore E. Miller, 3715 Annabelle St., Detroit, Mich. 48217
Filed Oct. 9, 1973, Ser. No. 404,666
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—27



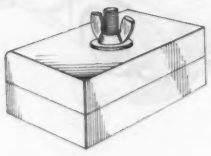
239,810
CARPET CLEANING APPARATUS
Gilbert G. Cyphert, 4320 N. 14th St., Phoenix, Ariz. 85014
Filed Aug. 12, 1974, Ser. No. 496,408
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D7—167

239,811
RECOVERY TANK FOR CARPET CLEANING APPARATUS
Gilbert G. Cyphert, 4320 N. 14th St., Phoenix, Ariz. 85014
Filed Aug. 12, 1974, Ser. No. 496,405
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D7—170

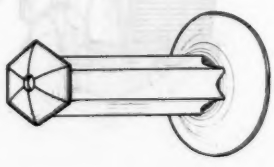


239,812
CHARCOAL BRIQUETTE SIEVE
Calvin Gould, Peabody, Mass. (11 Riverside Ave., Apt. 12, Danvers, Mass. 01923)
Filed Oct. 9, 1973, Ser. No. 404,137
Term of patent 14 years
Int. Cl. D7—*08*
U.S. Cl. D7—206

239,813
BRUSH PRESS
George A. Bradford, 1323 Beech Ave., Torrance, Calif. 90501
Filed Nov. 18, 1974, Ser. No. 524,636
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—71

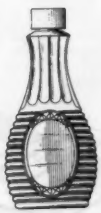


239,814
HAND GRIP
Preston L. Petty, 403 N. Main St., Newberg, Oreg. 97132
Filed July 26, 1974, Ser. No. 491,995
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—138

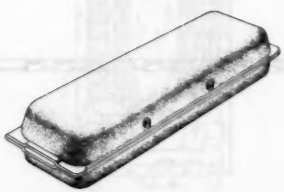


239,815
BUCKLE
James P. Oakes, Arcadia, Calif., assignor to Circle Industries, Inc., City of Industry, Calif.
Filed Mar. 15, 1974, Ser. No. 451,353
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—229

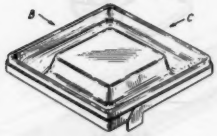
239,816
BOTTLE
Ernest F. Thomson, Fairfield, Conn., and Theodore L. Beaver, Roselle, Ill., assignors to General Foods Corporation, White Plains, N.Y.
Filed June 11, 1973, Ser. No. 369,012
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—105



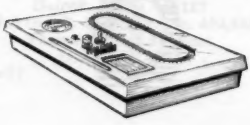
239,817
CARTON
George Kellogg, Reseda, Calif., assignor to Howmill Foods, Inc., Los Angeles, Calif.
Filed May 14, 1974, Ser. No. 469,823
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—183



239,818
CARTON COVER
Kaare Birger Vatne, Spikkestad, Norway, assignor to Elopak A/S., Spikkestad, Norway
Filed Nov. 15, 1974, Ser. No. 524,277
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—254



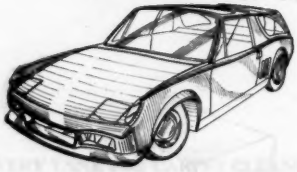
239,819
TIMER
Manuel Goy, 1215 S. Cloverdale Ave., Los Angeles, Calif. 90019
Filed Sept. 25, 1974, Ser. No. 509,248
Term of patent 14 years
Int. Cl. D10—*03*
U.S. Cl. D10—40



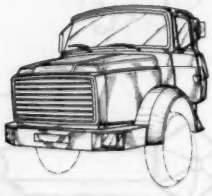
239,820
SAMPLING PROBE
Rowland Retrum, St. Louis, Mo., assignor to Ralston Purina Company, St. Louis, Mo.
Filed Sept. 18, 1974, Ser. No. 503,823
Term of patent 14 years
Int. Cl. D10—*99*
U.S. Cl. D10—46

239,821
SPIRIT LEVEL
Alfred Muller, 3 Avenue des Myrtilles, 67530 Ottrott, Bas-Rhin, France
Filed Nov. 4, 1974, Ser. No. 520,940
Claims priority, application France May 7, 1974
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—69

239,822
STATION WAGON
John C. Silva, Jr., Peabody, Mass. (P.O. Box 1082, Saugus, Mass. 01906)
Filed Feb. 5, 1973, Ser. No. 329,628
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—91



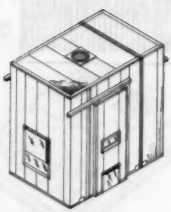
239,823
TRUCK CAB BODY
Jean Juillet, Lyon, Rhone, France, assignor to Automobiles M. Berliet, Lyon, France
Filed Sept. 12, 1974, Ser. No. 505,579
Claims priority, application France Mar. 14, 1974
Term of patent 7 years
Int. Cl. D12—*08*
U.S. Cl. D12—96



239,824
MOTORCYCLE FRAME
Rex A. Marsee, 5065 W. College Ave., Apt. 1, Greendale, Wis. 53129
Filed Jan. 27, 1975, Ser. No. 544,071
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—110

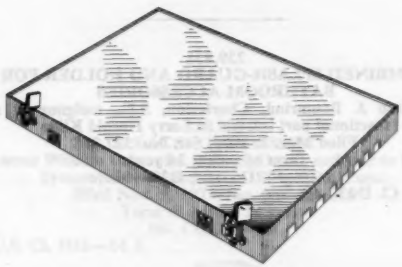
239,825
MOTORCYCLE FAIRING
Alan K. Kremer, Shullsburg, Wis., assignor to Meyer Materials, Inc., Indianapolis, Ind.
Filed Mar. 17, 1975, Ser. No. 559,171
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—182

239,826
NOISE REDUCING ENCLOSURE FOR A PUNCH PRESS OR THE LIKE
Richard T. Wheeler, 20 Hemlock Drive, Vernon, Conn. 06066
Filed Feb. 28, 1974, Ser. No. 446,815
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D25—33

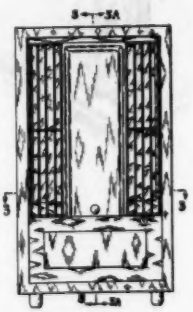


239,827
SCREEN
Ronald McKenzie Howells, Nelson Road (North), Yennora, New South Wales, Australia
Filed Nov. 6, 1972, Ser. No. 303,964
Claims priority, application Australia June 8, 1972
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—89

239,828
RETAIL FOOD MARKET
Howard Cooper, Suite 7707, John Hancock Center, Chicago, Ill. 60611
Filed Apr. 1, 1970, Ser. No. 22,188
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—8

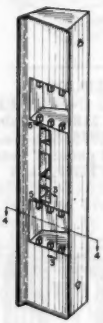


239,829
LIGHT ATTRACTING INSECT ELECTROCUTOR
Donald E. Gilbert, Box 2188, Jonesboro, Ark. 72401
Filed July 30, 1975, Ser. No. 600,361
Term of patent 7 years
Int. Cl. D22—*06*
U.S. Cl. D22—19

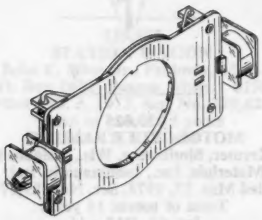


239,830
WEIGHT FOR TOILET FLUSH TANK VALVE
John E. Goldring, Pebble Beach, Calif., assignor to Jegco, Inc., Oakland, Calif.
Filed Feb. 13, 1974, Ser. No. 442,122
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—1

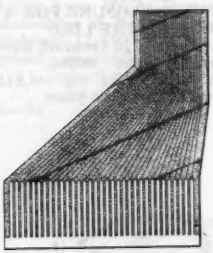
239,831
COMBINED SPLASH-GUARD AND HOLDER FOR BATHROOM ACCESSORIES
Stephen J. Baumrind, Charleston, S.C., assignor of a fractional part interest to Larry Harold Kline
Filed Mar. 2, 1973, Ser. No. 337,388
Term of patent 14 years
Int. Cl. D6—*04;* D23—*02*
U.S. Cl. D23—69



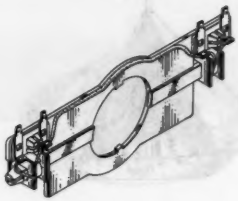
239,832
DEVICE FOR POSITIONING A PAIR OF COILS ON THE NECK PORTION OF A CATHODE RAY TUBE
Peter G. Puhak, Seneca Falls, N.Y., assignor to GTE Sylvania Incorporated, Seneca Falls, N.Y.
Filed Aug. 14, 1974, Ser. No. 497,277
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 D



239,833
FLEXIBLE ELECTRICAL CONNECTOR
Robert R. Rough, Jr., Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Dec. 26, 1973, Ser. No. 427,965
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 R



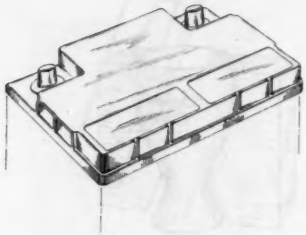
239,834
DEVICE FOR POSITIONING A PAIR OF COILS ON THE NECK PORTION OF A CATHODE RAY TUBE
Peter G. Puhak, Seneca Falls, N.Y., assignor to GTE Sylvania Incorporated, Seneca Falls, N.Y.
Filed Jan. 30, 1975, Ser. No. 545,524
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 D



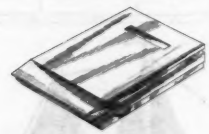
239,835
ELECTRONIC CALCULATING MACHINE
Katsuhiro Ishida, Osaka, Japan, assignor to Sharp Kabushiki Kaisha (Sharp Corporation)
Filed Aug. 6, 1974, Ser. No. 495,234
Claims priority, application Japan Feb. 22, 1974
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D26—5 C

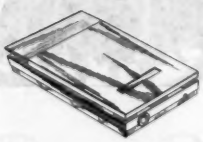
239,836
ELECTRONIC CALCULATING MACHINE
Matafumi Ikeda, Osaka, Japan, assignor to Sharp Kabushiki Kaisha (Sharp Corporation), Osaka, Japan
Filed Feb. 10, 1975, Ser. No. 548,241
Claims priority, application Japan Aug. 14, 1974
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D26—5 C

239,837
BATTERY COVER
Roy Erving Hennen, Mequon, Wis., assignor to Globe-Union Inc., Milwaukee, Wis.
Filed Jan. 20, 1975, Ser. No. 543,016
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D26—6



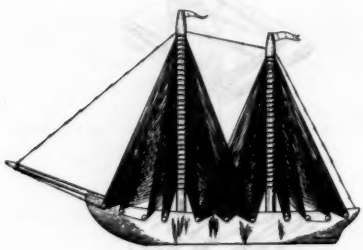
239,838
SPEAKER TELEPHONE
James William Crimmins, Wilton, Conn., assignor to Data Transmission Sciences Inc., Ridgefield, Conn.
Filed Nov. 9, 1973, Ser. No. 414,219
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A



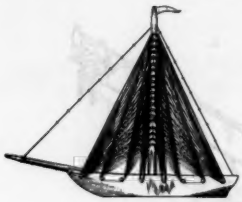


239,839
TROPHY
William Nicholas Frederick, 1858 N. Sedgwick St., Chicago, Ill. 60614
Filed June 5, 1974, Ser. No. 476,572
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D29—28 B

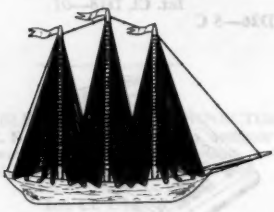
239,840
MODEL SHIP
Robert K. Tallent, Maryville, Tenn., assignor to Ship Shop Manufacturing Company, Inc., Maryville, Tenn.
Filed June 12, 1975, Ser. No. 586,269
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D29—23 A



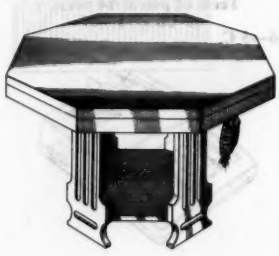
239,841
MODEL SHIP
Robert K. Tallent, Maryville, Tenn., assignor to Ship Shop Manufacturing Company, Inc., Maryville, Tenn.
Filed June 12, 1975, Ser. No. 586,270
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D29—23 A



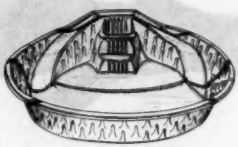
239,842
MODEL SHIP
Robert K. Tallent, Maryville, Tenn., assignor to Ship Shop Manufacturing Company, Inc., Maryville, Tenn.
Filed June 12, 1975, Ser. No. 586,271
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D29—23 A



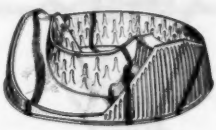
239,843
CONVERTIBLE GAME AND DINING TABLE
Myron Freeman, North Hollywood, Calif., assignor to Sunshine Cover and Tarp, Inc., North Hollywood, Calif.
Filed Nov. 19, 1973, Ser. No. 417,099
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—3



239,844
POOL WITH DUAL INTEGRALLY MOLDED SLIDES
Ascher Chase, Norfolk, Va., assignor to General Foam Plastics Corp., Norfolk, Va.
Filed May 17, 1972, Ser. No. 254,352
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 F

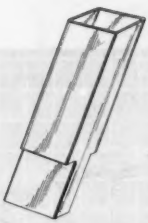


239,845
SLIDE-IN, SLIDE-OUT PLAY POOL
Ascher Chase, Norfolk, Va., assignor to General Foam Plastics Corp., Norfolk, Va.
Filed May 17, 1972, Ser. No. 254,353
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 F

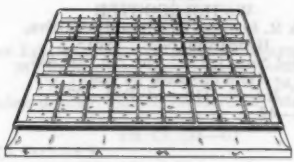


239,846
TOY FIGURE
Jens Nygaard Knudsen, Billund, and Leif Justesen, Give, Denmark, assignors to Interlego A.G., Zug, Switzerland
Filed Dec. 3, 1974, Ser. No. 529,136
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R

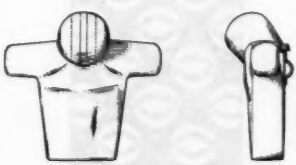
239,847
GOLF CLUB CARRIER
John L. Findeisen, 11026 S. Ave. L, Chicago, Ill. 60617
Filed Oct. 12, 1973, Ser. No. 405,917
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GB



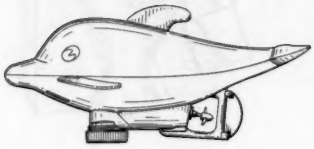
239,848
GAME BOARD
Eric S. Wessborg, 500 Sunburst Drive, Frankenmuth, Mich. 48734
Filed Jan. 14, 1974, Ser. No. 433,381
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



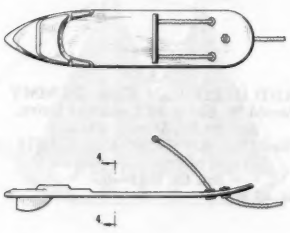
239,849
HAND HELD BLOCKING DUMMY
Harold W. Kopp, 21 Lancaster Drive, Saxonville, Mass. 01523
Filed Nov. 8, 1974, Ser. No. 522,015
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 K



239,850
TOY DOLPHIN
Duncan Tong, 423 Central Bldg., 3 Pedder St., Hong Kong
Filed May 9, 1974, Ser. No. 468,275
Claims priority, application Great Britain Nov. 14, 1973
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 B



239,851
WATER SCOOTER
Jack R. Bedient, 55 Richardson Drive, Henderson, Nev. 89015
Filed Nov. 3, 1972, Ser. No. 303,446
Term of patent 14 years
Int. Cl. D12—*14*; D21—*02*
U.S. Cl. D34—42

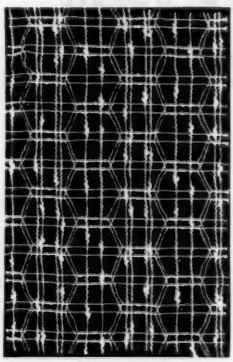


239,852
PLANT STAKE
Charles H. Stake, 346 Vine St., Sunbury, Pa. 17801
Filed May 1, 1975, Ser. No. 573,467
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D35—1

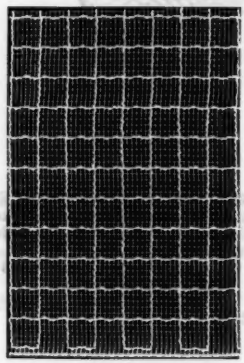
239,853
FLOWER STEM HOLDER
Loren C. Kienlen and Jack H. Poppler, Nisswa, Minn., assignors to Doormaid, Inc., Nisswa, Minn.
Filed Aug. 21, 1974, Ser. No. 499,126
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D35—3 R

239,854
MACRAME BRACELET
Margaret M. Kronewitter, Rte. 3, Edwardsburg, Mich. 49112
Filed Mar. 6, 1974, Ser. No. 448,522
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—4 C

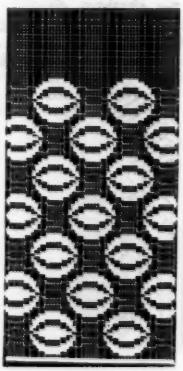
239,855
CURTAIN FABRIC
Peter Eric Schroeder, Lucerne, Switzerland, assignor to Gardisette International AG, Lucerne, Switzerland
Filed Nov. 15, 1974, Ser. No. 524,317
Claims priority, application Germany June 26, 1974
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D47—6 E



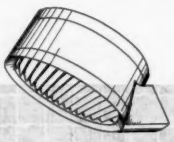
239,856
CURTAIN FABRIC
Peter Eric Schroeder, Lucerne, Switzerland, assignor to Gardisette International AG, Lucerne, Switzerland
Filed Nov. 15, 1974, Ser. No. 524,318
Claims priority, application Germany June 26, 1974
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D47—6 E



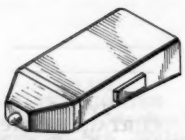
239,857
CURTAIN FABRIC
Peter Eric Schroeder, % Gardisette International AG, 38 Pilatusstrasse, 6003 Lucerne Switzerland
Filed Nov. 18, 1974, Ser. No. 524,933
Claims priority, application Germany May 25, 1974
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D47—6 E



239,858
LIGHTING FIXTURE
Tobia Scarpa, Via Campagna 3, Trevignano, Treviso, Italy
Filed Nov. 25, 1974, Ser. No. 526,834
Claims priority, application Italy Sept. 30, 1974
Term of patent 14 years
Int. Cl. D26—*03, 05*
U.S. Cl. D48—4 B

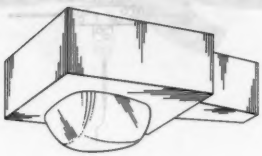


239,859
FLASHLIGHT FOR TELEPHONE RECEIVER
Jesse E. Ramsey, 101 Kenneth Road, Old Hickory, Tenn. 37138, and Albert K. Pond, 6909 Versaille, Sterling Heights, Mich. 48078
Filed Oct. 31, 1974, Ser. No. 519,408
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 A

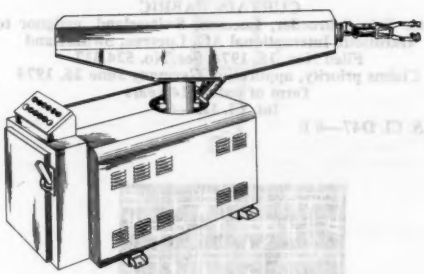


239,860
LIGHTING FIXTURE
Tobia Scarpa, Via Campagna 3, Trevignano, Treviso, Italy
Filed Nov. 25, 1974, Ser. No. 526,835
Claims priority, application Italy Sept. 30, 1974
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—31

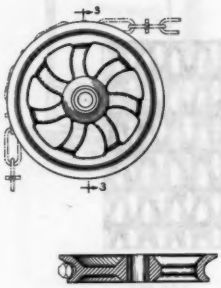
239,861
ROADWAY LUMINAIRE
Frank Van Steenhoven, Peninsula, Ohio, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Dec. 3, 1974, Ser. No. 529,201
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—31



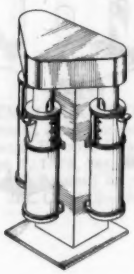
239,862
INDUSTRIAL ROBOT OR THE LIKE
John J. Wallace, Richland, Mich., assignor to Prab Conveyors, Inc.
Filed June 4, 1973, Ser. No. 366,724
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D55—1 R



239,863
POULTRY FEEDER CHAIN IDLER
Gerald L. Kitson, 9709 Belding Road, Rockford, Mich. 49341
Original design application July 14, 1972, Ser. No. 271,819, now abandoned. Divided and this application Sept. 17, 1974, Ser. No. 506,880
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D55—1 C



239,864
INDUSTRIAL APPARATUS FOR MILLING SOLID PARTICLES WITHIN A LIQUID SLURRY
Edward J. Szkaradek, Santa Ana, Calif., assignor to Morehouse Industries, Inc., Fullerton, Calif.
Filed Dec. 4, 1974, Ser. No. 529,299
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D55—1 B



239,865
RADIO
Jerome L. Pinsler, Evanston, and Anson Isaacson, Chicago, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Sept. 4, 1974, Ser. No. 502,921
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B

239,866
CLOCK RADIO
Shogo Imai, Osaka, Japan, assignor to Sharp Kabushiki Kaisha (Sharp Corporation)
Filed Nov. 2, 1973, Ser. No. 412,317
Claims priority, application Japan May 10, 1973
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B

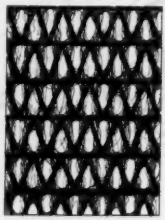
239,867
RADIO
Shogo Imai, Osaka, Japan, assignor to Sharp Kabushiki Kaisha (Sharp Corporation), Osaka, Japan
Filed Nov. 30, 1973, Ser. No. 420,376
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B

239,868
COMBINED BICYCLE RADIO AND LIGHT
Jerome L. Pinsler, Evanston, and Anson Isaacson, Chicago, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Sept. 4, 1974, Ser. No. 502,926
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B

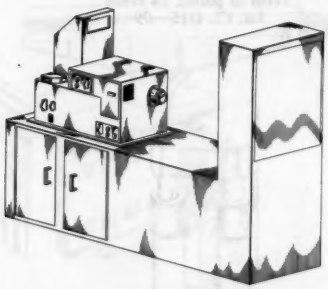
239,869
RADIO
Jerome L. Pinsler, Evanston, and Anson Isaacson, Chicago, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Sept. 4, 1974, Ser. No. 503,061
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B

239,870
PORTABLE RADIO
Jerome L. Pinsler, Evanston, and Anson Isaacson, Chicago, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Sept. 4, 1974, Ser. No. 503,070
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B

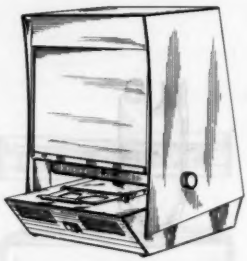
239,871
APERTURED NONWOVEN FABRIC
Yvon G. Levesque, Montreal, Quebec, and Gordon Douglas Russell, Chateauguay Heights, Quebec, Canada, assignors to Johnson & Johnson
Filed July 5, 1974, Ser. No. 485,848
Claims priority, application Canada Jan. 14, 1974
Term of patent 14 years
Int. Cl. D5—*05, 06*
U.S. Cl. D59—1



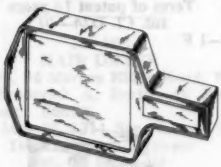
239,872
COMBINED CAMERA AND PROJECTOR
Arnold L. Pundsack, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Mar. 15, 1974, Ser. No. 451,655
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D16—1



239,873
MICROFILM READER
Paul Matwey, Binghamton, N.Y., assignor to GAF Corporation, New York, N.Y.
Filed Apr. 22, 1974, Ser. No. 462,939
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D16—14



239,874
TRANSPARENCY DISPLAY MODULE
Frederick M. Avery, Milwaukee, Wis., assignor to The Howard Company, Inc., Elm Grove, Wis.
Filed Sept. 9, 1974, Ser. No. 504,273
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D16—15



239,875
CONTAINER FOR EGGS OR THE LIKE
William J. Armstrong, Jeffersontown, Ky., assignor to General Electric Company
Filed Apr. 1, 1974, Ser. No. 456,990
Term of patent 14 years
Int. Cl. D15—*07*
U.S. Cl. D67—3 B

239,876
MARINE JET PROPULSION DRIVE
William L. Woodfill and Arthur F. Miller, Oshkosh, Wis., assignors to Brunswick Corporation, Skokie, Ill.
Filed May 1, 1974, Ser. No. 465,908
Term of patent 14 years
Int. Cl. D15—*01*
U.S. Cl. D77—1 R

239,877
THERAPEUTIC PULSE GENERATOR FOR ACUPUNCTURE
Wen Hsiang-Lai, Repulse Bay, and Gaylord Chan, North Point, Hong Kong, assignors to Biopulse Company Limited, Hong Kong
Filed Mar. 6, 1974, Ser. No. 448,539
Claims priority, application Great Britain Sept. 7, 1973
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D83—1 F

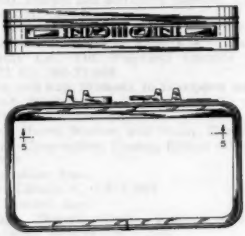
239,878
BLOOD FILTRATION UNIT
Herman Charles Mouwen, Ventura, Calif., and Francis Martin Servas, Belle Mead, N.J., assignors to Johnson & Johnson, New Brunswick, N.J., and Purolator, Inc.
Filed Apr. 19, 1974, Ser. No. 462,563
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D83—1 F

239,879
NEBULIZER-HUMIDIFIER CONTAINER FOR INHALATION THERAPY
Henry Komendowski, Des Plaines, Ill., assignor to Inhalation Therapy Equipment, Inc., Chicago, Ill.
Continuation-in-part of abandoned design application Ser. No. 468,436, May 9, 1974. This application Feb. 6, 1975, Ser. No. 547,609
Term of patent 14 years
Int. Cl. D9—*01*; D24—*01*
U.S. Cl. D83—1 N

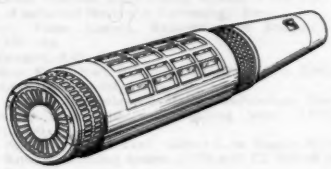
239,880
NEBULIZER-HUMIDIFIER CONTAINER FOR INHALATION THERAPY
Henry Komendowski, Des Plaines, Ill., assignor to Inhalation Therapy Equipment, Inc., Chicago, Ill.
Continuation-in-part of abandoned design application Ser. No. 468,435, May 9, 1974. This application Feb. 6, 1975, Ser. No. 547,610
Term of patent 14 years
Int. Cl. D9—*01*; D24—*01*
U.S. Cl. D83—1 N

239,881
DIALYZER CARTRIDGE
Brian Edson Morgan, Wheatridge, and Alex Hauzer, Littleton, Colo., assignors to Cobe Laboratories, Inc., Lakewood, Colo.
Filed July 14, 1975, Ser. No. 595,616
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D83—1 F

239,882
COMBINED VALANCE, LOCK AND HANDLE SUPPORT FOR LUGGAGE OR THE LIKE
Edward M. Stolarz, Yorktown Heights, N.Y., assignor to Presto Lock Company, Division of Walter Kidde & Company, Inc., Elmwood Park, N.J.
Filed Nov. 5, 1974, Ser. No. 521,041
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—5 R

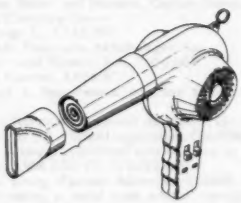


239,883
HAIR DRYER
Douglas A. Long, 94 Sturges Ridge Road, Wilton, Conn. 06897, and Frederick A. Burke, 40 Riverside Ave., Riverside, Conn. 06878
Filed May 10, 1974, Ser. No. 468,948
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 F



239,884
HAIR DRYER
Petrus Jacobus Johanna Nagelkerke, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed July 17, 1974, Ser. No. 489,353
Claims priority, application Switzerland Feb. 8, 1974
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 F

239,885
HAIR DRYER
Kwok Tze Leung, Kowloon, Hong Kong, assignor to Raymond Industrial Ltd., Kwun Tong, Kowloon, Hong Kong
Filed Nov. 27, 1974, Ser. No. 527,590
Claims priority, application Great Britain May 29, 1974
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 F



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 11TH DAY OF MAY, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. E. Staley Manufacturing Company: *See—*
Coker, Lowell E.; and Gardner, Donald E., 3,956,066.
Moore, Carl O.; Cheng, Hsiung; and Schanefelt, Robert V., 3,956,515.

A. H. Robins Company, Incorporated: *See—*
Duncan, Robert Louis, Jr.; and Boswell, Robert Frederick, Jr., 3,956,296.

AB Linde International: *See—*
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Abbott Laboratories: *See—*
Allain, Charles C.; and Henson, Carl P., 3,956,069.

Abcor, Inc.: *See—*
Del Pico, Joseph; and Sternberg, Shmuel, 3,956,114.

Abdo, Kamal M.: *See—*
Hahn, Peter A.; and Abdo, Kamal M., 3,956,482.

Abe, Hiroshi; Kazitani, Koichi; Saito, Koichi; and Nakamoto, Hisashi, to Kuraray Co., Ltd. Polyvinyl chloride paste compositions. 3,956,222, Cl. 260-32.60R.

Abe, Morio; and Kaji, Masaaki, to Dainippon Ink and Chemicals, Incorporated. Binding strap, and process for manufacturing same. 3,956,450, Cl. 264-210.00R.

Abel, Heinz; Harris, Melvin; and Massy, Derek James Rowland, to Ciba-Geigy Corporation. Coating fibrous substrates. 3,956,554, Cl. 428-95.000.

Abex Corporation: *See—*
Kubilos, Charles A., 3,955,369.

Abukawa, Toshimi: *See—*
Morinaga, Shigeki; Onishi, Kazuo; Abukawa, Toshimi; and Kawamata, Syoichi, 3,955,273.

Accurate Wirecraft Company: *See—*
Baren, Louis, 3,955,682.
Baren, Louis, 3,955,683.

Acushnet Company: *See—*
Cochran, Alastair J.; Jepson, John W.; Woolley, Edward R.; and deS. Lynch, Francis, 3,955,820.

Adams, Leslie R., to Motor Wheel Corporation. Method of making an ornamental styled wheel. 3,956,451, Cl. 264-45.500.

Addison, Earl H., to Cooper Aviation Industries, Inc.; and Hydrosol, Inc. Finishing process for fabric covered air frame structure. 3,956,529, Cl. 427-171.000.

Aeroflex Laboratories, Inc.: *See—*
Silverman, Alvin J., 3,956,649.

Aerojet-General Corporation: *See—*
Steele, Roger Beresford; Katzakian, Arthur, Jr.; and Weyland, Herman H., 3,956,241.

Aeros Instruments, Inc.: *See—*
Martin, Gordon D., 3,955,572.

Afflerbach, Frank D.; Barnett, Irvin; and Peters, Walter B., to Johns-Manville Corporation. Glass fiber friction element. 3,956,545, Cl. 428-37.000.

AGA Aktiebolag: *See—*
Ullstig, Stig Leopold, 3,956,586.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See—*
Jolles, Pierre; and Migliore-Samour, Daniele, 3,956,481.
Teichner, Stanislas; and Echevin, Bernard, 3,956,475.

Agency of Industrial Science & Technology: *See—*
Tsuya, Yuko; Umeda, Kazunori; and Shimura, Hirofumi, 3,956,146.

AGFA-Gevaert, A.G.: *See—*
Kuffner, Karl; Meier, Ernst; and Glockner, Hans, 3,956,311.
Schausberger, Helmut, 3,956,764.

Ahlrot, Ake, to Aktiebolaget Svenska Flaktfabriken. Apparatus for connecting ducts with a self-sealing joint. 3,955,834, Cl. 285-110.000.

Ahrens, Allan F.; and Cardwell, Gilbert I., to Hughes Aircraft Company. Battery paralleling system. 3,956,638, Cl. 307-48.000.

Ahrens, Hanns: *See—*
Biere, Helmut; Ahrens, Hanns; Rufer, Clemens; Schroder, Eberhard; and Koch, Henning, 3,956,295.

Aiba, Takaaki: *See—*
Hara, Naoyoshi; Fujimori, Akihiro; Hashimoto, Hideo; Hosoi, Takuji; Aiba, Takaaki; and Okamoto, Tsuneo, 3,956,101.

Aiello, Joseph A. Process for manufacturing cheese product. 3,956,520, Cl. 426-582.000.

Aiga, Hiroshi: *See—*
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Airco, Inc.: *See—*
McLeod, Paul S., 3,956,093.

Airfix Industries Limited: *See—*
Sutch, Brian Leo Chudleigh, 3,956,550.

Aitcin, Pierre-Claude; and Poulin, Claude, to Universite de Sherbrooke. Spherical aggregates. 3,956,003, Cl. 106-288.00B.

Akashi, Shunji, to Yoshida Kogyo Kabushiki Kaisha. Slide fastener slider. 3,955,248, Cl. 24-205.15R.

Akazawa, Tadashi: *See—*
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Akeyson, Swan M. Combined cultivating and particled material applying gardening tool. 3,955,513, Cl. 111-8.000.

Aktiebolaget C. E. Johansson: *See—*
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Aktiebolaget Electrolux: *See—*
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Aktiebolaget Svenska Elektromagneter: *See—*
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Albert, Leonard E.: *See—*
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Alfa Romeo S.p.A.: *See—*
Garcea, Giampaolo, 3,956,433.

Alford, John A.: *See—*
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Algoma Steel Corporation, Limited, The: *See—*
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Allain, Charles C.; and Henson, Carl P., to Abbott Laboratories. Enzymatic assays for glucose, creatine phosphokinase or plasma ammonia. 3,956,069, Cl. 195-103.50R.

Allied Chemical Corporation: *See—*
Bollen, Phillip Stuart; Amin, Surendra A.; and Sacks, William, 3,956,229.
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Lee, Lester T. C.; Ho, Win-Sow; and Liu, Kang-Jen, 3,956,112.
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Allied Products Company: *See—*
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Allmanna Svenska Elektriska Aktiebolaget: *See—*
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Nimmersjo, Gunnar, 3,956,671.

Allonca, Manuel J. Non-friction coupling system. 3,955,378, Cl. 64-30.00R.

Almer, Friedrich Hermann Raymond; de Ridder, Jan; and T'Jampens, Germain Remi, to U.S. Philips Corporation. Gas-filled electric incandescent lamp having a cylindrical envelope and an axially arranged filament body. 3,956,659, Cl. 313-222.000.

Alt, Anton, to Georg Fischer Aktiengesellschaft. Apparatus and method for treating a metal melt with a vaporizable substance. 3,955,974, Cl. 75-130.00R.

Altenburger, Otto; and Soni, Sureshar L., to Stromberg-Carlson Corporation. Automatic toll ticketing. 3,956,592, Cl. 179-7.1TP.

Altermatt, Ruedi, to Sandoz Ltd. Substituted phenyl-azo-phenylene-azo-phenyl dyes. 3,956,268, Cl. 260-187.000.

Aluminum Company of America: *See—*
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King, Larry K.; Knapp, Lester L.; Schoener, Ronald C.; Kloap, Nicholas; Starner, Bernard M.; and Remper, John A., 3,956,455.

Amanrich, Robert, to Azote et Produits Chimiques S.A. Solvent purification of wet process phosphoric acid. 3,956,465, Cl. 423-321.00S.

Amax Inc.: *See—*
Moore, Fred W.; Hallada, Calvin J.; and Barry, Henry F., 3,956,231.

AMBA Marketing Systems, Inc.: *See—*
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Amberg, Stephen W.; and Ludder, Rodney E., to Owens-Illinois, Inc. Close nesting, tamperproof container closure. 3,955,699, Cl. 215-246.000.

Amchem Products, Inc.: *See—*
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Amemiya, Masahiro: *See—*
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American Cyanamid Company: *See—*
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Coscia, Anthony Thomas; Panzer, Hans Peter; and Sedlak, John Andrew, 3,956,122.
Crawley, Lantz Stephen; and Safir, Sidney Robert, 3,956,343.
Miller, Richard K., 3,955,986.
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American Locker Company: *See—*
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American Optical Corporation: *See—*
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American Plasticraft Company: *See—*
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American Screen Printing Equipment Company: *See—*
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Amin, Surendra A.: *See—*
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Aminkemi AB: *See—*
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Amoco Oil Company: *See—*
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AMP Incorporated: *See—*
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Loomis, Phillip Eugene; and Morgan, Joe Pierce, 3,955,275.

Anaconda Company, The: *See—*
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Anderson, Gary C.; and Kasbo, Loyd G., to Kendall Company, The. Nonwoven electrical insulation base fabrics. 3,956,561, Cl. 428-288.000.

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Anderson, Paul Brent. Method and apparatus for air purification. 3,956,458, Cl. 423-210.000.

Anderson, Randy H., to International Telephone and Telegraph Corporation. Contact insertion apparatus. 3,955,414, Cl. 29-203.00B.

Anderson, Robert M., to General Electric Company. Multiple flashlamp array. 3,956,625, Cl. 240-1.300.

Anderson, Thomas G.; Boothroyd, William A.; and Frey, Richard C., to International Business Machines Corporation. Transaction execution system with secure data storage and communications. 3,956,615, Cl. 235-61.70B.

Ando, Tadahiko: *See—*
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Andren, Ingmar Karl Linus: *See—*
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Anrep, Rene. Method of and installation for treating various objects by means of microwaves. 3,955,286, Cl. 34-1.000.

Ansel, Fred N.: *See—*
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Cline, Harvey E.; and Anthony, Thomas R., 3,956,024.
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Aoki, Hachiro; and Sunaga, Motonobu, to Diesel Kiki Kabushiki Kaisha. Fuel injection device for internal combustion engines. 3,955,547, Cl. 123-139.0BC.

Aotsu, Hiroaki; Isono, Akira; and Uchiyama, Yoshihiro, to Hitachi, Ltd. Intercept valve controlling method and system for use in a heat power plant. 3,956,637, Cl. 290-40.00R.

Appel, Carl; Heiss, Wilhelm; and Gsollpointner, Helmuth. Embossed decorative facing panel. 3,955,261, Cl. 29-180.0SS.

Aqua-Chem, Inc.: *See—*
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Furutachi, Nobuo; and Arai, Atsuaki, 3,956,339.

Arai, Yoshi; Kinoshita, Shoichi; Kimura, Kazuo; Wada, Tomio; Yamamoto, Hisashi; and Funada, Fumiaki, to Dainippon Ink and Chemicals, Incorporated; Dainippon Ink Institute of Chemical Research; and Sharp Corporation, a part interest to each. Liquid crystal compositions. 3,956,168, Cl. 252-299.000.

Arakawa, Hideyuki: *See—*
Nagoshi, Fumiya; Arakawa, Hideyuki; and Matsuo, Masaki, 3,956,425.

Arao, Masachika, to Garrett Corporation, The. Fluid coupled drive apparatus. 3,955,365, Cl. 60-330.000.

Arcata Microfilm Corporation: *See—*
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Arick, Robert E. Variable speed drive mechanism. 3,955,435, Cl. 74-411.000.

Arion, Nicolae Mihai, to Institutul de Proiectari Pentru Industria Chimica Anorganica si A Ingrasamintelor. Process for the regeneration of ion-exchange resins and applications thereof. 3,956,115, Cl. 210-30.00R.

Armand, Michel B. Mixed conductors of graphite, processes for their preparation and their use. 3,956,194, Cl. 252-507.000.

Armstrong, Albert L.; Bakeman, Paul E., Jr.; Woodhull, Joel; Taft, Wayne C.; and Ketola, H. Norman, to RRC International, Inc. Data collecting system. 3,956,753, Cl. 346-34.000.

Armstrong Cork Company: *See—*
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Arnheim, William M., III: *See—*
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Arrandale, Roy S.; Cady, James H.; and Hartman, Leroy C., to Dart Industries Inc. Chuck member including fluid draft. 3,955,824, Cl. 279-1.00R.

Artemov, Lev Nikolaevich; Bilyavsky, Anatoly Arkadievich; Vivsik, Stanislav Nikolaevich; Zozulya, Nikolai Vasilievich; Manaenkov, Valery Ivanovich; Moskvichev, Viktor Fedorovich; and Fadeev, Evgeny Alexeevich. Heat exchanger. 3,955,620, Cl. 165-162.000.

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Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
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Asculai, Samuel Simon, to Ortho Pharmaceutical Corporation. Serologic reaction method. 3,955,923, Cl. 23-230.00B.

Askew, Malcolm Anthony. Weighing apparatus for truck and vehicle loads. 3,955,636, Cl. 177-137.000.

Asselman, George Albert Apolonia; and van der Leegte, Josef Wilhelmus Johannes Maria, to U.S. Philips Corporation. Heating device. 3,955,618, Cl. 165-105.000.

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Bailey, John M., Jr., to Xerox Corporation. Electrostatographic process. 3,955,977, Cl. 96-1.400.
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Bard, Donald I. Needlework frame support stand. 3,955,722, Cl. 223-106.000.
Baren, Louis, to Accurate Wirecraft Company. Laboratory shelf for funnel-shaped glassware. 3,955,682, Cl. 211-74.000.
Baren, Louis, to Accurate Wirecraft Company. Laboratory rack and shelf for funnel-shaped glassware. 3,955,683, Cl. 211-74.000.
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Bosch, Erhard; Pirson, Ewald; and Roth, Michael, to Wacker-Chemie GmbH. Stable water repellent compositions. 3,955,985, Cl. 106-2.000.
Bosch, Erhard; Roth, Michael; and Gogolok, Konrad, to Wacker-Chemie GmbH. Binder composition for inorganic compounds. 3,955,988, Cl. 106-38.350.
Bosch, Erhard; Braunsperger, Karl; Gluck, Herbert; Pirson, Ewald; and Roth, Michael, to Wacker-Chemie GmbH. Method for imparting water-repellency to construction materials. 3,956,570, Cl. 428-446.000.
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Bossi, Oscar. Electric traction transportation system with storage battery powered vehicles and fast recharge at the vehicle stops. 3,955,657, Cl. 191-2.000.
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Boulain, Robert Georges Pierre. Process of continuous fabrication of elastomer or plastomer tubes from aqueous dispersions. 3,956,442, Cl. 264-95.000.
Bounds, Joseph W.; Goldstein, Lynn E.; and Willard, Franklin E., to Texel Industries, Inc. Industrial mop-treating machine. 3,955,528, Cl. 118-2.000.
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Bradley, Robert L.; Sadowski, Anthony J.; and Ballweber, Edward G., to Nalco Chemical Company. Cationic polymers for breaking oil-in-water emulsions. 3,956,117, Cl. 210-43.000.
Bramberga, Velta Mikelevna; Khesin, Arkady Yakovlevich; Grendze, Teodor Arvidovich; and Libenson, Mark Naumovich. Method of cytological diagnosis of precancer conditions and cancer. 3,955,559, Cl. 128-2.00R.
Brammerlo, Allen A., to General Electric Company. Wire stator structure. 3,956,651, Cl. 310-218.000.
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Brock, James Donald; and Mize, Erbie Gail, to Astec Industries, Inc. Superheat apparatus for drying textile products. 3,955,287, Cl. 34-155.000.
Brocoff, Jack, to Ralph M. Parsons Company. Process for the treatment of gas streams containing hydrogen cyanide. 3,956,460, Cl. 423-221.000.
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Brown, Arthur E. Two stroke cycle internal combustion engine. 3,955,543, Cl. 123-61.00R.
Brown, Earle C.; and Jones, J. Dennis, to Ontario Research Foundation. Method of spray forming glass coating on concrete blocks. 3,956,534, Cl. 427-243.000.
Brown, George L., to Allied Products Company. Display stand. 3,955,787, Cl. 248-159.000.
Brown, Jack Frederick, to James Ross Limited. Pressure finger for doctor blade assembly. 3,955,531, Cl. 118-261.000.
Brown, Victor Elwyn, to E. L. Caldwell & Sons, Inc. Row marker for agricultural implement. 3,955,627, Cl. 172-130.000.
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Brudy, Peter E., to Dominion Auto Accessories Limited. Shock resistant lamp support. 3,955,872, Cl. 339-93.00L.
Brugger, Max; Kahnt, Friedrich Werner; Kamber, Bruno; Neher, Robert; Riniker, Bernhard; Rittel, Werner; Sieber, Peter; Zuber, Herbert; and Greven, Hendrik Marie, to Ciba-Geigy Corporation. Hypocalcaemic peptides and processes for their manufacture. 3,956,260, Cl. 260-112.50T.
Brundage, Keene N. Plate assembly. 3,955,672, Cl. 206-72.000.
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Geary, Arthur L., 3,955,390.
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Bruyere, Jean-Marie. Floating measurement amplifier. 3,956,707, Cl. 330-10.000.
Bubley, Henry J.; and Oltra, Claude H., to American Screen Printing Equipment Company. Squeegee and flood bar actuator. 3,955,501, Cl. 101-123.000.
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Bullis, Douglas E., to Remington Arms Company, Inc. Adjustable means to vary point of impact of over-and-under firearms. 3,955,299, Cl. 42-1.00R.
Bullock, Greg A.; and Sharp, Silas S. Certain dithiazolylidene ureas. 3,956,303, Cl. 260-306.80R.
Bunger, Richard E. Apparatus for converting the residual nutritive content of animal waste into nutritious and palatable feed supplement for refeeding to livestock. 3,955,536, Cl. 119-28.000.
Bunker Ramo Corporation: *See—*
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Burger, Heinz; Zuern, Ludwig; Buchholz, Karl; and Stahnecker, Erhard, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Manufacture of particulate expandable styrene polymers requiring shot minimum residence times in the mold. 3,956,203, Cl. 260-2.50B.
Burkhardt, Joseph A.; and Childers, Thomas W., to Exxon Production Research Company. Valve stem static seal system. 3,955,793, Cl. 251-95.000.
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Buslik, David. Preservation of paint brush. 3,955,670, Cl. 206-15.300.
Bussler, Thomas M. Bicycle kickstand support pad. 3,955,829, Cl. 280-301.000.
Bustmante, Antonio B. Brake controlled throttle holder. 3,955,658, Cl. 192-3.00T.
Butler, John Mann: *See—*
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Campbell, Clarence C.; and Finfinger, Dean A., to Hercules Incorporated. Alpha methyl styrene and vinyl toluene and processes of preparation. 3,956,250, Cl. 526-194.000.
Campolong, Joseph, to Pall Corporation. Vortex separator. 3,955,948, Cl. 55-394.000.
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Carlsson, Hans Thorsten Henrik, to Aktiebolaget Svenska Elektromagneter. Flywheel magneto ignition device with capacitor-thyristor ignition combined with generator. 3,955,550, Cl. 123-149.00D.
Carlton & United Breweries Limited: *See—*
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Carmichael, Richard Quentin; and Bonelle, Roger George, to T.I. (Group Services) Limited. Cutting of metals by shearing. 3,955,453, Cl. 83-189.000.
Carpenter, William G.; Herman, Daniel F.; and Berndlmaier, Rudolph J., to N L Industries, Inc. Crosslinked vinyl acetate-maleic anhydride heteropolymers and derivatives prepared from them. 3,956,244, Cl. 526-79.000.
Carrarini, Aldo. Speaking time keeper. 3,956,597, Cl. 179-100.10C.
Carrieri, Louis F., to Gulf & Western Manufacturing Company. Press overload protection system. 3,955,396, Cl. 72-432.000.
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Cassimatis, Peter Nicholas; and McComas, John Roy, to Johns-Manville Corporation. Rotatable sprinkler and water deflector used therewith. 3,955,762, Cl. 239-230.000.
Cassonnet, Jean-Claude Marcel, to Compagnie Honeywell Bull (Societe Anonyme). Sequential micro-instruction selection apparatus. 3,956,735, Cl. 340-172.500.
Casutt, Toni. Pack for packaging fragile articles. 3,955,744, Cl. 229-28.00R.
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Chalmers, Brian John, to C.A.V. Limited. Brushless A.C. synchronous motors. 3,956,679, Cl. 318-171.000.
Chamness, Dale L.; and Osborne, Thomas A., to Cook Inc. Rotatable surgical snare. 3,955,578, Cl. 128-303.150.
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Chang, Tai-Hon Philip, to International Business Machines Corporation. Combined multiple beam size and spiral scan method for electron beam writing of microcircuit patterns. 3,956,635, Cl. 250-492.00A.
Chari, Srinivasan Venkata: *See—*
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Cho, Nakwon, to Electro-Nucleonics, Inc. Valve actuator mechanism. 3,955,792, Cl. 251-69.000.
Chou, Chen-Yen; and Chou, Su-Chin. Method of fabricating an electrolytic cell gas sensor. 3,955,268, Cl. 29-570.000.
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Clark, William E. Pre-gapped breaker point assembly. 3,956,602, Cl. 200-31.00A.

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Cline, Harvey E.; and Anthony, Thomas R., to General Electric Company. Process for making a semiconductor varistor embodying a lamellar structure. 3,956,024, Cl. 148-1.500.

Cline, Harvey E.; and Anthony, Thomas R., to General Electric Company. Making a deep diode varactor by thermal migration. 3,956,026, Cl. 148-1.500.

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Cody, John P.; and Kane, James J., to United States of America, Energy Research and Development Administration. Handling apparatus. 3,955,692, Cl. 214-18.00N.

COFPA-Compagnie des Feutres pour Papeteries et des Tissus Industriels: *See—*
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Coker, Lowell E.; and Gardner, Donald E., to A. E. Staley Manufacturing Company. Glucose isomerizing enzyme. 3,956,066, Cl. 195-31.00F.

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Coleman Company, Inc., The: *See—*
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Coleman, John R., Jr.; Plummer, Mark A.; Zimmerman, Carle C., Jr.; Pietrzak, Henry J.; Luetzelschwab, Wayne E.; Robinson, Kent W.; and Schroeder, Donald E., Jr., to Marathon Oil Company. Process for the production of petroleum sulfonate. 3,956,372, Cl. 260-505.00S.

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Coles, John W.; and Kneips, Dean F., to C & K Sales Corporation. Awning construction. 3,955,611, Cl. 160-67.000.

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Osband, Arthur Norman; Gray, Frederick William; and Jervert, Jon C., 3,956,156.

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Cobaugh, Robert Franklin; and Coller, James Ray, 3,955,877.

Collie, Robert L. Solar heating system. 3,955,554, Cl. 126-270.000.

Collingwood, David S., to Cornerboard, Inc. Cornerboard protector. 3,955,677, Cl. 206-453.000.

Collins, Arthur A.; Bellamy, John C., II; and Christensen, Richard L., to Artura A. Collins, Inc. Time space time (TST) switch with combined and distributed state store and control store. 3,956,593, Cl. 179-15.0AQ.

Colson, James G.: *See—*
Merrifield, D. Bruce; Pawlak, Joseph A.; and Colson, James G., 3,956,428.

Colt Industries Operating Corporation: *See—*
Smitley, Marion L., 3,955,641.

Comer, Robert C., to Toro Company, The. Rotary mower blade arrester apparatus. 3,955,653, Cl. 188-273.000.

Commercial Decal, Inc.: *See—*
Blanco, Louis A.; and Wenning, William F., 3,956,558.

Commercial Solvents Corporation: *See—*
Mudd, Daniel G., 3,956,305.

Commissariat a l'Energie Atomique: *See—*
Audaire, Luc; Borel, Joseph; le Goascoz, Vincent; and Poujois, Robert, 3,956,624.

Commisso, Nicholas D., to Mobil Oil Corporation. Covered container for serving food with combination ventilation and finger holes. 3,955,710, Cl. 220-367.000.

Compagnie Honeywell Bull (Societe Anonyme): *See—*
Cassonnet, Jean-Claude Marcel, 3,956,735.
Petiot, Gerard, 3,955,875.

Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
de Loye, Martin; Leonard, Didier; and Cardot, Claude, 3,956,578.
Mary, Jacques; and Merillou, Pierre, 3,956,754.

Condon, Joseph Henry, to Bell Telephone Laboratories, Incorporated. Two-feedback-path delta modulation system with circuits for reducing pulse width modulation. 3,956,700, Cl. 325-38.00B.

Congoleum Industries, Inc.: *See—*
Minzey, Ronald D., 3,955,223.

Conley, James F., to Maremont Corporation. Feed transfer mechanism. 3,955,469, Cl. 89-33.0BB.

Connally, Carl A.: *See—*
Young, Walter L.; Douglas, C. J.; Connally, Carl A.; and Cheek, Robert L., 3,956,061.

Connelly, James C.: *See—*
Stayton, Leroy M.; Thielbahr, William H.; and Connelly, James C., 3,956,453.

Connolly, David Charles Antony; Hovland, Per Jorgen; and Stevenson, Robert Andrew, to General Electric Company Limited, The. Circuit arrangements in telephone apparatus. 3,956,596, Cl. 179-90.00K.

Conradi, Eugene P.: *See—*
De Puydt, Frank A.; and Conradi, Eugene P., 3,955,852.

Container Corporation of America: *See—*
Bell, John T., 3,955,747.

Continental Can Company, Inc.: *See—*
Pasternack, George; and Jondahl, Thor P., 3,956,235.

Continental Oil Company: *See—*
Fredd, John V.; Hill, William G.; Kearney, Benjamin E.; and Tynan, John W., deceased, 3,955,624.
Neuworth, Martin B., 3,956,359.
Umphrey, Ronald W.; and McCain, David L., 3,955,593.

Control Data Corporation: *See—*
Beecroft, Harold James; and Chari, Srinivasan Venkata, 3,956,769.

Conway, John E., to Universal Oil Products Company. Hydroprocessing of hydrocarbons. 3,956,105, Cl. 208-111.000.

Cook, Edward H., Jr., to Hooker Chemicals & Plastics Corporation. Electrochemical anode and process using the anode. 3,956,083, Cl. 204-95.000.

Cook Inc.: *See—*
Chamness, Dale L.; and Osborne, Thomas A., 3,955,578.

Coon, James G. Apparatus for the recovery of cotton from the ground. 3,955,346, Cl. 56-28.000.

Cooper Aviation Industries, Inc.: *See—*
Addison, Earl H., 3,956,529.

Cooper, Robin D. G., to Eli Lilly and Company. 7-(α-furoylureidoaryl and cyclohexadienylacetamido) cephalosporin antibiotics. 3,956,292, Cl. 260-243.00C.

Copp, Robert M., to Goldman, Rubin. Edge proximity sensor for moving sheet. 3,955,454, Cl. 83-368.000.

COQ B.V.: *See—*
Fierst Van Wijnandsbergen, Marius Frederik, 3,956,607.

Corbiere, Claude. High speed knitting machine. 3,955,379, Cl. 66-1.00R.

Cordano, Richard D.: *See—*
Jacques, James O.; Cordano, Richard D.; Heidecker, Robert F.; and Hertrich, Friedrich R., 3,956,736.

Cordon, Martin; and Pintenich, Brian J., to Colgate-Palmolive Company. Abrasive agglomerates of abrasive subparticles and binder material. 3,955,942, Cl. 51-295.000.

Corey, Howard Seebree, Jr.; Barringer, William Charles; and Hansen, Lloyd Frank, to American Cyanamid Company. N,N-diethyl-4-methyl-1-pi-perazinecarboxamide pamoate. 3,956,330, Cl. 260-268.0BC.

Corll, James A.: *See—*
Tucker, Howard E.; Corll, James A.; and Hogg, Walter R., 3,955,436.

Corman, James C.; and Walmet, Gunnar E., to General Electric Company. Heat transfer device. 3,955,619, Cl. 165-105.000.

Corneau, George E., to Indev, Inc. Pipe wall thickness gauge. 3,955,425, Cl. 73-552.000.

Cornelius, Thomas Edward, III: *See—*
Walker, Jerry Lee; and Cornelius, Thomas Edward, III, 3,956,164.

Cornell Iron Works, Inc.: *See—*
Rawls, William W.; Buchholz, Alex; and Walsh, John P., 3,955,840.

Cornerboard, Inc.: *See—*
Collingwood, David S., 3,955,677.

Corporate Products Research: *See—*
Remijas, Jerry, 3,955,238.

Coscia, Anthony Thomas; Panzer, Hans Peter; and Sedlak, John Andrew, to American Cyanamid Company. Cationic arylamide-styrene copolymers and flocculation of sewage therewith. 3,956,122, Cl. 210-54.000.

Costa, Lorenzo F.: *See—*
VanAllan, James A.; Ericson, Ronald H.; and Costa, Lorenzo F., 3,955,982.

Costello, Alan Thomas: *See—*
Austin, Peter William; Costello, Alan Thomas; and Crabtree, Allen, 3,956,300.

Couture, John W., to Automation Industries, Inc. Ultrasonic NDT system with flashing display alarm. 3,955,405, Cl. 73-67.700.

Covington, Edward L. Videotape cassette automatic loader-unloader. 3,956,768, Cl. 360-92.000.

CPC International Inc.: *See—*
Idaszak, Leo R.; Terranova, Richard A.; and Heady, Robert E., 3,956,065.

Crabtree, Allen: *See—*
Austin, Peter William; Costello, Alan Thomas; and Crabtree, Allen, 3,956,300.

Cragg, Harold, to Spastics Society, The. Wheel chairs. 3,955,639, Cl. 180-6.500.

Cragoe, Edward J., Jr.: *See—*
Shepard, Kenneth L.; Cragoe, Edward J., Jr.; and Halczenko, Wasyl, 3,956,374.

Craig, Glenn D.; Feuling, David T.; and La Haye, Paul G., to Aqua-Chem, Inc. Reduction of gaseous pollutants in combustion flue gas. 3,955,909, Cl. 431-10.000.

Crawford, Theodore C., to United States of America, Energy Research and Development Administration. High explosive compound. 3,956,039, Cl. 149-21.000.

Crawley, Lantz Stephen; and Safir, Sidney Robert, to American Cyanamid Company. Novel 5-vinyl-3-isoxazolyl substituted pyridines. 3,956,343, Cl. 260-296.00R.

Cresswell, Ronald Morton; Mentha, John W.; and Seaman, Russell L., to Burroughs Wellcome Co. Method of preparing 2,4-diamino-5-benzyl pyrimidines. 3,956,327, Cl. 260-256.40N.

Crockett, Fred Benton. Compositions of fire-extinguishing foam concentrates and method of using the same. 3,956,138, Cl. 252-3.000.

Crosby, Edward Lewis, Jr., to RCA Corporation. Process for nondestructive inspection. 3,956,631, Cl. 250-321.000.

Crosfield Electronics Limited: *See—*
Pugsley, Peter C., 3,956,583.

Crown Cork & Seal Company, Inc.: *See—*
Urban, Joseph J., 3,955,496.

Crumpler, Doris L., beneficiary: *See—*
Dow, Marvin B.; Bush, Harold G.; Haraway, William M., Jr.; and Crumpler, John F., deceased, 3,956,050.

Crumpler, John F., deceased: *See—*
Dow, Marvin B.; Bush, Harold G.; Haraway, William M., Jr.; and Crumpler, John F., deceased, 3,956,050.

Culpin, Michael Frank: *See—*
Palmer, Bryan Albert; and Culpin, Michael Frank, 3,956,553.

Cummings, Donald R.; and O'Sullivan, Kenneth J., to Petrocarbon Developments Limited. Plural stage distillation with intermediate indirect heat exchange, of feed streams comprising ethylene and methane. 3,956,415, Cl. 260-683.00R.

Cunningham, Robert F.; Walsh, Edward J.; Graham, C. Samuel; Slayton, Willie D.; and Hailine, Adrian, to United States of America, Health, Education and Welfare. Filtering apparatus. 3,956,130, Cl. 210-198.00R.

Cuno Melcher KG ME-Sportwaffen, Firma: *See—*
Wiethoff, Gunter, 3,955,301.

Cuntze, Ulrich; Dollinger, Gustav; and Kleber, Rolf, to Hoechst Aktiengesellschaft. Preparation for the antistatic finishing of fibers. 3,956,143, Cl 252-8.800.

Currie, Robert D., to Anaconda Company, The. Sample selector apparatus and method. 3,955,422, Cl. 73-423.00R.

Curry, Alan Dale; Levine, Leon; and Rose, Dennis William, to Procter & Gamble Company, The. Method of forming rippled chip-type products. 3,956,517, Cl. 426-502.000.

Curtice, Beverly A.; and Harnsberger, Bobby G., to Texaco Inc. Method and composition for stabilizing incompetent oil-containing formations. 3,955,993, Cl. 106-90.000.

Cusumano, James A., to Exxon Research and Engineering Company. Method for making bimetallic catalysts. 3,956,191, Cl. 252-474.000.

D & M Technologies: *See—*
Hradcovsky, Rudolf J.; and Bayles, S. Heagan, Jr., 3,956,080.

D S C Industries, Inc.: *See—*
Kramer, Milton H., 3,955,224.

Daehler, Max: *See—*
Knight, Sheldon A.; and Daehler, Max, 3,955,891.

Dahl, Klaus J.; and Jansons, Viktors, to Raychem Corporation. Novel polyketones. 3,956,240, Cl. 260-47.00C.

Dai-Ichi Kogyo Seiyaku Co., Ltd.: *See—*
Watanabe, Yutaka; and Ueno, Hiroshi, 3,956,160.

Dai Nippon Toryo Kabushiki Kaisha: *See—*
Yaguchi, Mashachika; Jinnai, Toshio; Shirotsuka, Mikio; and Totani, Kazuo, 3,955,881.

Daigo, Koji; Okuyama, Shinichi; and Oda, Kyuzo, to Sakai Chemical Industry Company Ltd. Barium sulfate contrast medium containing ascorbic acid, erythorbic acid or a water-soluble salt thereof. 3,956,476, Cl. 424-4.000.

Daiichi Seiyaku Co., Ltd.: *See—*
Shimizu, Eiichi, 3,956,503.

Daikin Kogyo Co., Ltd.: *See—*
Horiuchi, Takeshi; and Ogawa, Kazuaki, 3,955,475.

Daikin Kogyo Kabushiki Kaisha: *See—*
Katsushima, Atsuo; Imazu, Shinichi; Fukui, Shoshin; Iwatani, Akitoshi; and Akazawa, Tadashi, 3,956,405.

Daimler-Benz Aktiengesellschaft: *See—*
Ehret, Fritz; Worner, Otto; and Juskowiak, Ulrich, 3,955,659.
Scherenberg, Hans O., 3,955,539.

Dainichi-Nippon Cables, Ltd.: *See—*
Kato, Hiroshi; and Maekawa, Nobuyuki, 3,956,420.

Dainippon Ink and Chemicals, Incorporated: *See—*
Abe, Morio; and Kaji, Masaaki, 3,956,450.
Arai, Yoshi; Kinoshita, Shoichi; Kimura, Kazuo; Wada, Tomio; Yamamoto, Hisashi; and Funada, Fumiaki, 3,956,168.

Dainippon Ink Institute of Chemical Research: *See—*
Arai, Yoshi; Kinoshita, Shoichi; Kimura, Kazuo; Wada, Tomio; Yamamoto, Hisashi; and Funada, Fumiaki, 3,956,168.

Dall'Asta, Gino: *See—*
Greco, Alberto; Pirinoli, Franco; and Dall'Asta, Gino, 3,956,178.

Dames & Moore: *See—*
Garbe, Carl W., 3,956,059.

Dana Corporation: *See—*
Kessmar, Leo R., 3,955,442.

Dancy, William H., Jr., to United States of America, Energy Research and Development Administration. Gas centrifuge with driving motor. 3,955,753, Cl. 233-1.00C.

Daniels, Michael G., to Westinghouse Electric Corporation. Apparatus for measuring the resistance of an inductor, having time constant compensation. 3,956,696, Cl. 324-62.000.

Dart Industries Inc.: *See—*
Arrandale, Roy S.; Cady, James H.; and Hartman, Leroy C., 3,955,824.
Dobson, William C.; and Straughn, James M., 3,956,613.

Datsko, Taisia Fedorovna: *See—*
Topchiashvili, Mikhail Izmailovich; Datsko, Taisia Fedorovna; Kikvilashvili, Givi Mikhailovich; and Maisuradze, Ledi Alexeevna, 3,956,195.

Daubach, Ewald: *See—*
von Rambach, Leonhard; Daubach, Ewald; and Honigmann, Bertold, 3,956,270.

David, Anton; and Treusch, Peter, to ITT Industries, Inc. Radial piston-type pump. 3,955,476, Cl. 91-491.000.

Davidtz, John C., to Mobil Oil Corporation. Flocculation process. 3,956,119, Cl. 210-47.000.

Davis, Alan C.; and Di Persio, Domenic, to Beatrice Foods Company. Valve actuator mechanism. 3,955,431, Cl. 74-100.00R.

Davis, Dalton M., to E-T Industries, Inc. Spider machining apparatus. 3,955,896, Cl. 408-1.00R.

Davis, James E., to Spiral Productions, Inc. Toy boomerang. 3,955,817, Cl. 273-106.00D.

Davis, Philip S.: *See—*
Hansen, Gerald D.; Varney, Elizabeth G.; and Davis, Philip S., 3,956,165.

Davy International Limited: *See—*
Dunkley, John Joseph, 3,955,606.

Dawes, Dag; and Bohner, Beat, to Ciba-Geigy Corporation. Triazolylthiophosphoric acid esters. 3,956,306, Cl. 260-308.00R.

Dawihl, Walter; and Eicke, Walter, to Klockner-Werke AG. Method of and apparatus for producing metal fibers in a magnetic field. 3,955,962, Cl. 75-.5AA.

Dawson, Peter Leonard; and Rothwell, Michael Tom, to Lever Brothers Company. Dishwashing compositions. 3,956,199, Cl. 252-545.000.

Days-Ease Home Products Corporation: *See—*
Bauer, Henry, 3,956,198.

de la Chauviniere, Francois: *See—*
de la Chauviniere, Riant, nee Chantal; and de la Chauviniere, Francois, 3,955,297.

de la Chauviniere, Riant, nee Chantal; and de la Chauviniere, Francois. Device for animating an image. 3,955,297, Cl. 40-106.530.

De Laval Separator Company, The: *See—*
Walsh, John C., 3,955,617.

Dean, Charles. Door lock. 3,955,838, Cl. 292-179.000.

DeAngelis, Armand: *See—*
Laliberte, Albert J.; and DeAngelis, Armand, 3,956,540.

de Bruyne, Norman Adrian. Orbital oscillating stirrer. 3,955,802, Cl. 259-117.000.

de Castella, Pierre M. T.; and Fichter, Rene A., to Baumatic S.A. Crane cable attachment. 3,955,844, Cl. 294-67.00R.

deCaussin, David Edward, to Fadal Engineering Company, Inc. Attachment for automating milling machines. 3,955,267, Cl. 29-568.000.

de Dobo, Aranka Elisabeth: *See—*
de Dobo, Tibor Louis, 3,955,903.

de Dobo, Tibor Louis, to de Dobo, Aranka Elisabeth. Rotary piston engine with improved housing and piston configuration. 3,955,903, Cl. 418-61.00B.

Deep Oil Technology, Inc.: *See—*
Walker, Raymond W., 3,955,599.

Deere & Company: *See—*
Robinson, Michael, 3,955,973.

Deering Milliken Research Corporation: *See—*
Richards, Ernest Levon, 3,956,551.
Yates, Robert V., Jr., 3,955,335.

Degremont, S.A.: *See—*
Turner, Abner B., 3,956,128.

de Haan, Douwe Rienk; and Kettenes, Dirk Karel, to P.F.W. Beheer B.V. 1-Crotonyl-2,2,6-trimethylcyclohexanes. 3,956,392, Cl. 260-586.00R.

Del Pesco Systems, Inc.: *See—*
Del Pesco, Andrew, Sr., 3,955,884.

Delage, Jean. Apparatus for positioning and supporting optical laboratory instruments. 3,955,788, Cl. 248-228.000.

Delarue, Christian; and Vidal, Roger, to Rhone-Poulenc-Textile. Apparatus for treating yarn with fluid material. 3,955,254, Cl. 28-1.600.

Del Ciello, Robert R., to Quasar Electronics Corporation. Standby power supply. 3,956,669, Cl. 315-411.000.

DeLew, Richard Brandt, to Varian Associates. Flame photometric detector employing premixed hydrogen and oxygen gases. 3,955,914, Cl. 431-353.000.

Dellar, Richard John: *See—*
McGuigan, Brian; Dellar, Richard John; and Phillips, William David, 3,956,289.

de Loye, Martin; Leonard, Didier; and Cardot, Claude, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Facsimile system for the transmission of picture. 3,956,578, Cl. 178-6.000.

Del Pesco, Andrew, Sr., to Del Pesco Systems, Inc. Magnifying lens holder assembly. 3,955,884, Cl. 350-248.000.

Del Pico, Joseph; and Sternberg, Shmuel, to Abcor, Inc. Process for the concentration of polyvinyl-chloride emulsion. 3,956,114, Cl. 210-23.00F.

Del Rosso, Victor, to Hi-Speed Checkweigher Co., Inc. Weighing apparatus. 3,955,637, Cl. 177-145.000.

Del Rosso, Victor: *See—*
Pettis, Charles R., Jr.; and Del Rosso, Victor, 3,955,665.

Demag Aktiengesellschaft: *See—*
Westerhuis, Karl; and Hahn, Gunther, 3,955,806.

Demain, Arnold L.; and Nagaoka, Kozo, to Massachusetts Institute of Technology. 2-Deoxystreptomycin. 3,956,275, Cl. 260-210.00S.

Demny, Thomas C.: *See—*
Scannell, James P.; Pruess, David L.; and Demny, Thomas C., 3,956,067.

Dempsey, James G., to Langley Hill Quarry. Sewage septic system for a plurality of drain fields. 3,956,137, Cl. 210-532.00S.

Denommee, Maurice R.; Furrer, Jack F.; McManus, Lawrence R.; and Durand, Philip E., to United States of America, Army. Method of making deep drawn, laminated articles. 3,956,447, Cl. 264-135.000.

de Nora, Oronzio: *See—*
de Nora, Vittorio; and de Nora, Oronzio, 3,956,097.

de Nora, Vittorio; and de Nora, Oronzio, to Electronor Corporation. Titanium blankets and anode constructions for diaphragm cells. 3,956,097, Cl. 204-252.000.

den Otter, Marinus J. A. M.; Hawinkels, Lambertus P. G.; and Schouteten, Augustinus P. H., to Stamicarbon B.V. Process for the preparation of cyanuric acid. 3,956,299, Cl. 260-248.00A.

De Puydt, Frank A.; and Conradi, Eugene P., to Dico Company, Inc. Trailer hub cap device. 3,955,852, Cl. 301-108.00R.

de Ridder, Jan: *See—*
Almer, Friedrich Hermann Raymond; de Ridder, Jan; and T'Jampens, Germain Remi, 3,956,659.

Deschamps, Andre; and Faye, Georges, to Societe Lignes Telegraphiques et Telephoniques. Production of fine grained ferrite bodies. 3,956,440, Cl. 264-56.000.

Deschesnes, Gilles. Hockey training device. 3,955,815, Cl. 273-1.00B.

Desher, Elmer J.: *See—*
Dubois, Robert A; and Desher, Elmer J., 3,955,705.

Design Alliance, Inc.: *See—*
Doernberg, Robert J.; Huddleston, Earl J.; and Mariol, James F., 3,955,421.

deS. Lynch, Francis: *See—*
Cochran, Alastair J.; Jepson, John W.; Woolley, Edward R.; and deS. Lynch, Francis, 3,955,820.

DeTorre, Robert P., to PPG Industries, Inc. Method of maintaining edge strength of a piece of glass. 3,956,547, Cl. 428-43.000.

Dettling, Joseph C.: *See—*
Hindin, Saul G.; and Dettling, Joseph C., 3,956,188.

Deutsche Babcock & Wilcox Aktiengesellschaft: *See—*
Meyer, Georg Michael, 3,955,932.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Haschke, Heinz; Knorre, Helmut; Morlock, Gerhard; and Pohl, Gerhard, 3,956,121.
Isaac, Otto, 3,956,491.
Muck, Gustav; Rothbuhr, Lothar; and Stoklossa, Kurt, 3,956,106.
Schwarze, Werner; and Schreyer, Gerd, 3,956,304.
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Devaney, Mark J.: *See—*
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Dewberry, Albert W.: *See—*
Tine, Sebastian David; Dewberry, Albert W.; and Schommer, Alfred S., 3,955,647.

DeZinno, Theophile L., to Plastic Graphix Corporation. Article retainer for stacked assembly. 3,955,681, Cl. 211-13.000.

Dial-A-Channel, Inc.(Entire): *See—*
Doumit, Joseph A., 3,956,579.

Diamantoglou, Michael: *See—*
Bosshard, Hans; Diamantoglou, Michael; Koelliker, Hans Peter; and Karlen, Urs, 3,956,345.

Diaz, Benigno. Sewer pest control check valve. 3,955,596, Cl. 137-527.000.

Dichter, Michael; Mangaraj, Durydehan; and King, William James, to Colgate-Palmolive Company. Treatment of teeth. 3,956,480, Cl. 424-54.000.

Dickens, Richard T.; and Khalid, Joseph M., to Square D Company. Current limiting circuit breaker. 3,956,723, Cl. 335-201.000.

Dickensheets, William E.; Harrison, Robert S.; Lunsford, Max W.; Medrick, John D.; Nowroski, Alvin P.; and Weslock, Charles K., to Ford Motor Company. Carburetor cold enrichment fuel metering signal and air flow modulator. 3,956,434, Cl. 261-39.00B.

Dico Company, Inc.: *See—*
De Puydt, Frank A.; and Conradi, Eugene P., 3,955,852.

Diesel Kiki Kabushiki Kaisha: *See—*
Aoki, Hachiro; and Sunaga, Motonobu, 3,955,547.

Dieterman, Alfred Johannes: *See—*
Riem, Roland Hendrick; and Dieterman, Alfred Johannes, 3,956,220.

Dietsche, Robert B., to Avant Industries, Inc. Automatic silverware sorting construction. 3,956,109, Cl. 209-73.000.

Di Persio, Domenic: *See—*
Davis, Alan C.; and Di Persio, Domenic, 3,955,431.

Director-General of the Agency of Industrial Science and Technology: *See—*
Honda, Hidemasa; Yamada, Yasuhiro; Kakiyama, Hitoo; Imamura, Takeshi; and Nakagawa, Masanao, 3,956,436.

Dixon, William D.; and Becker, Maureen E., to Monsanto Company. α-Cyano-α-dialkylphosphonato acetanilde herbicides. 3,955,958, Cl. 71-87.000.

Doan, Jack L.: *See—*
Barnes, James L.; and Doan, Jack L., 3,956,771.

Dobson, William C.; and Straughn, James M., to Dart Industries Inc. Base element for an immersible electric coffee maker. 3,956,613, Cl. 219-436.000.

Dockner, Toni; and Platz, Rolf, to BASF Aktiengesellschaft. Manufacture of concentrated aqueous (meth)acrylamide solutions by catalytic addition of water to (meth)acrylonitrile. 3,956,387, Cl. 260-561.00N.

Doerman, Eryk Stefan: *See—*
Molins, Desmond Walter; and Doerman, Eryk Stefan, 3,955,584.

Doernberg, Robert J.; Huddleston, Earl J.; and Mariol, James F., to Design Alliance, Inc. Periphyton sampler for water quality monitoring. 3,955,421, Cl. 73-421.00R.

Dolhyj, Serge R.; and Milberger, Ernest C., to Standard Oil Company (Ohio), The. Production of unsaturated acids from the corresponding aldehydes. 3,956,377, Cl. 260-530.00N.

Dollinger, Gustav: *See—*
Cuntze, Ulrich; Dollinger, Gustav; and Kleber, Rolf, 3,956,143.

Dominion Auto Accessories Limited: *See—*
Brudy, Peter E., 3,955,872.

Dompas, John M. A.; and Hazelett, Robert William, to Hazelett Strip-Casting Corporation. Twin-belt continuous casting apparatus. 3,955,615, Cl. 164-278.000.

Donaldson, Robert, to Lever Brothers Company. Pourable liquid compositions. 3,956,158, Cl. 252-102.000.

Donohue, Paul Christopher, to Du Pont de Nemours, E. I., and Company. Orthorhombic rare earth Hf and Zr sulfides and selenides. 3,956,461, Cl. 423-263.000.

Doorakian, George A.; and Duquette, Lawrence G., to Dow Chemical Company, The. Epoxy resin compositions comprising latent amine curing agents and novel accelerators. 3,956,237, Cl. 260-47.0EN.

Doring, Fritz: *See—*
Hagemann, Hermann; Schwarz, Herbert; and Doring, Fritz, 3,956,089.
Douglas, C. J.: *See—*
Young, Walter L.; Douglas, C. J.; Connally, Carl A.; and Cheek, Robert L., 3,956,061.
Doumit, Joseph A., to Dial-A-Channel, Inc.(Entire). Program schedule displaying system. 3,956,579, Cl. 178-6.000.
Dow Chemical Company, The: *See—*
Doorakian, George A.; and Duquette, Lawrence G., 3,956,237.
Gulbenk, Alin H.; and Ruetman, Sven H., 3,956,338.
Hughes, Earnest D.; and Seitz, Peter W., 3,955,625.
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Olstowski, Franciszek; and Parrish, Donald B., 3,956,221.
Paritee, Frederick; Alford, John A.; and Reineke, Charles E., 3,956,399.
Dow Corning Corporation: *See—*
Plueddemann, Edwin P., 3,956,353.
Dow, Marvin B.; Bush, Harold G.; Haraway, William M., Jr.; and Crumpler, John F., deceased (by Crumpler, Doris L., beneficiary), to United States of America, National Aeronautics and Space Administration. Vacuum pressure molding technique. 3,956,050, Cl. 156-242.000.
Draper, John C.: *See—*
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Franz, William F.; and Cole, Edward L., to Texaco Inc. Isoparaffin-olefin alkylation utilizing a continuous sulfuric acid phase in a tubular reaction zone. 3,956,417, Cl. 260-683.630.
Frazier, James L., to Houdaille Industries, Inc. Machine tool spindle. 3,955,471, Cl. 90-11.00D.
Fredd, John V.; Hill, William G.; Kearney, Benjamin E.; and Tynan, John W., deceased (by Tynan, Dorothy H., administratrix), to Continental Oil Company. Safety valve for controlling flow in a flow conductor. 3,955,624, Cl. 166-72.000.
Freeman, Marshall E. Self-seating tire traction apparatus for clampingly engaging tire sidewalls. 3,955,610, Cl. 152-213.00A.
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Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
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Furlenmeier, Andre; Quitt, Peter; Vogler, Karl; and Lanz, Paul, to Hoffmann-La Roche Inc. Furan, benzofuran and tetrahydrofuran carboxylic acid esters. 3,956,323, Cl. 260-347.500.

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Gall, Martin, to Upjohn Company, The. 9H-Dibenzo[b,f]imidazo[1,2-d][1,4]diazepines. 3,956,297, Cl. 260-247.5EP.

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Gallucci, Francis; and Slamar, Frank, to United States Steel Corporation. Adjustable apparatus for cutting a continuously-formed casting into short-length segments. 3,955,804, Cl. 266-50.000.

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Garcia, Luis A.; and Ordonez, Guido A., to Baxter Laboratories, Inc. Fractionation of blood using block copolymer of ethylene oxide and polyoxypropylene polymer to recover fraction suitable for organ perfusate. 3,956,259, Cl. 260-112.00B.

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Gates, William A., Jr. Two-input automatic source selector for stereo entertainment center. 3,956,591, Cl. 179-1.0SW.

Gaudiano, Anthony V.; Hawks, Larry E.; McDole, James E.; and Shanahan, Joseph W., to Peninsular & Oriental Steam Navigation. Method and apparatus for launching, retrieving, and servicing a submersible. 3,955,522, Cl. 114-43.5VC.

Gauthier, Maurice, to COFPA-Compagnie des Feutres pour Papeteries et des Tissus Industriels. Method and device for closing the fastener of a belt, more particularly a textile belt. 3,955,263, Cl. 29-200.00P.

Gauvry, Robert; Portalier, Robert; and Catsaros, Constantin, to Societe de Vente de l'Aluminum Pechiney. Blanks for wiredrawing by impact. 3,955,262, Cl. 29-190.000.

Gaylord, Norman G., to Champion International Corporation. Compatibilization of hydroxyl-containing fillers and thermoplastic polymers. 3,956,230, Cl. 260-42.140.

Gazeley, Keith Frederick, to Malaysian Rubber Producers Research Association, The. Latex setting materials. 3,956,217, Cl. 260-29.7NR.

Geary, Arthur L., to Brunswick Corporation. Twist drawn wire, process and apparatus for making same. 3,955,390, Cl. 72-64.000.

Geary, Joseph E., to Champion Products Inc. Flocked heat transfer method, apparatus and article. 3,956,552, Cl. 428-88.000.

Gebauer, Bodo Gustav, to GTE Automatic Electric Laboratories Incorporated. Apparatus for separating remanent reedblades from tumbling media. 3,955,679, Cl. 209-115.000.

Gebhardt, Adolph Armor, to Singer Company, The. Sewing machine loop taker mounting. 3,955,520, Cl. 112-256.000.

Geiger, Werner, to Inventio AG. Foundry molding machine. 3,955,614, Cl. 164-210.000.

Geiszler, Theodore D.; and Wilenken, Richard, to Geiszler, Theodore D. Motion detection system. 3,956,743, Cl. 340-258.00C.

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Gigliotti, Michael F. X., Jr.; and Greskovich, Charles D., to General Electric Company. Ceramic molds having a metal oxide barrier for casting and directional solidification of superalloys. 3,955,616, Cl. 164-361.000.

Gilbert, Everett E., to United States of America, Army. Process for purifying TNT. 3,956,409, Cl. 260-645.000.

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Giocolano, Santi Riccardo, to Singer Company, The. Belt tensioning mechanism for tiltable sewing machines. 3,955,518, Cl. 112-217.100.

Gladkikh, Vera Fedorovna: *See*—
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Glaze, Stanley George; and Simmons, John Richard, to Joseph Lucas (Industries) Limited. Hydraulic actuating arrangement for aircraft control surfaces. 3,955,783, Cl. 244-85.000.

Gleason, Charles H., to Westinghouse Electric Corporation. Long lived proportional counter neutron detector. 3,956,654, Cl. 313-61.00D.

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Goerling, Paul Martin; and Zuercher, Klaus Paul Ernest, to Nabisco, Inc. Process for continuously producing a roasted cocoa mass and for manufacturing a chocolate mass. 3,955,489, Cl. 99-485.000.

Gogolok, Konrad: *See*—
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Gold, Elijah H.; and Babad, Esther, to Schering Corporation. Preparation of amines. 3,956,390, Cl. 260-570.600.

Goldbach, Raymond A., to Kraftco Corporation. Method of slicing and stacking cheese. 3,956,518, Cl. 426-518.000.

Goldman, Rubin: *See*—
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Goldmark, Peter C., to Goldmark Communications Corporation. Performance learning system. 3,955,466, Cl. 84-470.000.

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Goncalves, Antonin, to L'Oreal. Decorative cover for valved end of pressurized containers. 3,955,716, Cl. 222-153.000.

Goodman, Donald; Miller, Robert S.; and Stanaback, Robert J., to Tenneco Chemicals, Inc. Manufacture of polyvinyl chloride of low vinyl chloride monomer content by treatment of wet polyvinyl chloride. 3,956,249, Cl. 528-500.000.

Goodman, Gregory L. Novelty article. 3,955,315, Cl. 46-238.000.

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Gordon, James Sneddon, to Texas Instruments Incorporated. Frequency responsive circuit. 3,956,685, Cl. 321-60.000.

Gordon, Paul C.: *See*—
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Gorling, Karl Goran, to Boliden Aktiebolag. Method for roasting finely divided sulphide material consisting of magnetic pyrites or of a finely divided material derived from a pyritic material, in which thermally splittable sulphur is expelled by partial roasting or other thermal treatment. 3,955,960, Cl. 75-3.000.

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Gotz, Karl Georg, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Mechanical-electrical transducer. 3,956,618, Cl. 235-151.300.

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Gould, Douglas Eugene; Young, David Edward; Anderson, Lowell Ray; and Fox, William Burke, to Allied Chemical Corporation. Pentafluorosulfur hypochlorite. 3,956,470, Cl. 423-466.000.

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Grant, Richard John, to Calgon Corporation. Controlled selectivity activated carbon. 3,955,944, Cl. 55-74.000.

Grasselli, Robert K.; Miller, Arthur F.; and Shaw, Wilfrid G., to Standard Oil Company (Ohio), The. Oxidation catalyst. 3,956,181, Cl. 252-432.000.

Grasselli, Robert K.; Suresh, Dev D.; and Milberger, Ernest C., to Standard Oil Company (Ohio), The. Process for the manufacture of unsaturated aldehydes and acids from the corresponding olefins. 3,956,378, Cl. 260-533.00N.

Gray, Frederick William: *See*—
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Gray, Ronald D., to Pennsylvania Engineering Corporation. Cooling means for electric arc furnaces. 3,956,572, Cl. 13-32.000.

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Grebow, Mark; Grebow, Janet; Albert, Leonard E.; Albert, Irma; and Ansel, Fred N. Beach chair. 3,955,849, Cl. 297-183.000.

Greco, Alberto; Pirinoli, Franco; and Dall'Asta, Gino, to Montedison S.p.A. Three-component metathesis catalysts. 3,956,178, Cl. 252-429.00B.

Green, David: *See*—
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Greenwood, Kurt; and Lanz, Philippe, to Heberlein & Co. AG. Process and apparatus for controlling twist density during texturing. 3,955,349, Cl. 57-34.0HS.

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Griffith, Russell K.; and Jones, John F., to Standard Oil Company. Manufacture of impact-resistant olefinic-nitrile copolymers. 3,956,246, Cl. 526-338.000.

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Jacques, James O.; Cordano, Richard D.; Heidecker, Robert F.; and Hertrich, Friedrich R. Disc cartridge sector formatting arrangement and record addressing system. 3,956,736, Cl. 340-172.500.

Jaffe, Wolfgang: *See—*
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Jagdmann, Kenneth M.: *See—*
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James, Justin Melvin, Jr.; Smith, Richard LaGrange; Ruggiero, George William; and Clapp, Roger Edge, to Bell & Howell Company. Personal paging receiver with swivel clip and distributed antenna. 3,956,701, Cl. 325-352.000.
James Ross Limited: *See—*
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Jansons, Viktors: *See—*
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Jenkins, R. B., Jr., to Jenkins Metal Shops, Inc. Fiber retriever. 3,955,244, Cl. 19-107.000.
Jensen, Henry E.; and Wagner, Franz M., to Eltra Corporation. Insulator for battery connections. 3,956,576, Cl. 174-138.00F.
Jepson, John W.: *See—*
Cochran, Alastair J.; Jepson, John W.; Woolley, Edward R.; and deS. Lynch, Francis, 3,955,820.
Jeris, John S.; Beer, Carl; and Mueller, James A., to Ecolotrol, Inc. Waste treatment apparatus. 3,956,129, Cl. 210-189.000.
Jervert, Jon C.: *See—*
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Jessop, Kenneth Gilbert, to Stelmo Limited. Tunnelling shields. 3,955,373, Cl. 61-85.000.
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Cassimatis, Peter Nicholas; and McComas, John Roy, 3,955,762.
Fosness, Donald Edson, 3,955,673.
Harris, Walter William; and Pickard, David Jon, 3,955,951.
Johnsen, Edward L. Continuous business form or the like adapted for subsequent processing into original indicia bearing lottery tickets, envelopes or the like. 3,956,049, Cl. 156-200.000.
Johnson, Arthur F., to R.C.M. Corporation. Process for the production and use of activated alumina. 3,955,969, Cl. 75-68.00R.
Johnson, David Alan: *See—*
Jones, Michael Dale; Johnson, David Alan; Wright, Carl Taylor; and Bell, William Sherman, Jr., 3,956,740.
Johnson, David Emil, to Mobil Oil Corporation. Method and apparatus for butt welding thermoplastics sheets and films. 3,956,047, Cl. 156-159.000.
Johnson, Donald L., to J. I. Case Company. Push-pull cable mounting assembly. 3,955,441, Cl. 74-501.00R.
Johnson, Edwin W., Jr. Uni-directional rope. 3,955,467, Cl. 87-7.000.
Johnson, Glenn W., Jr. Orthopedic apparatus. 3,955,565, Cl. 128-89.00R.
Johnson, Harry G.; and Madsen, Ronald N., to United States of America, Energy Research and Development Administration. Emergency core cooling system for a fast reactor. 3,956,063, Cl. 176-38.000.
Johnson & Johnson: *See—*
Krzewinski, Henrietta K.; and Gorrie, Thomas M., 3,955,569.
Johnson, Lowell E.: *See—*
Hansen, Robert C.; and Johnson, Lowell E., 3,955,366.
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Johnson, Paul H.: *See—*
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Johnson, Richard H.; and Kuhn, Wayne H., to Stone Container Corporation. Compression section roller for packaging machine. 3,955,342, Cl. 53-387.000.
Johnson, Richard I.: *See—*
Thornburg, David D.; and Johnson, Richard I., 3,956,042.
Johnson Service Company: *See—*
Matthews, Russell Byron, 3,955,910.
Johnston, Lawrence H., to United States of America, Energy Research and Development Administration. Detonating apparatus. 3,955,505, Cl. 102-28.00R.
Jolles, Pierre; and Migliore-Samour, Daniele, to Agence Nationale de Valorisation de la Recherche (ANVAR). Hydrosoluble extracts of mycobacteria, their preparation and use. 3,956,481, Cl. 424-92.000.
Jonas, Heinz: *See—*
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Jones, Charles M.; and Wu, Hai, to Ford Motor Company. Exhaust heat conservation. 3,955,362, Cl. 60-274.000.
Jones, Clive Righton; and Rogerson, Michael John, to Imperial Chemical Industries Inc. Production of bulked yarns. 3,955,351, Cl. 57-140.00R.
Jones, Howard: *See—*
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Jones, Howard W., to Regan Offshore International, Inc. Dual drill string orienting apparatus and method. 3,955,622, Cl. 166-.500.
Jones, J. Dennis: *See—*
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Jones, James William Samuel: *See—*
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Jones, John Clifford, to FMC Corporation (U.K.) Limited. Article handling apparatus. 3,955,688, Cl. 214-6.00F.
Jones, John F.: *See—*
Griffith, Russell K.; and Jones, John F., 3,956,246.
Jones, John Paul, to Procter & Gamble Company, The. Stable concentrated liquid peroxygen bleach composition. 3,956,159, Cl. 252-104.000.
Jones, Malcolm Glyn Desmond: *See—*
Evans, Mervyn Thomas Arthur; Jones, Malcolm Glyn Desmond; and Jones, Norman, 3,956,519.
Jones, Michael Dale; Johnson, David Alan; Wright, Carl Taylor; and Bell, William Sherman, Jr., to Telxon Corporation. Portable data entry apparatus. 3,956,740, Cl. 340-172.500.
Jones, Norman: *See—*
Evans, Mervyn Thomas Arthur; Jones, Malcolm Glyn Desmond; and Jones, Norman, 3,956,519.
Jones, Warren S. Portable antenna for use within a vehicle. 3,956,750, Cl. 343-712.000.
Jordan, Bertram L.: *See—*
Mitchell, John D.; and Jordan, Bertram L., 3,955,345.
Jordan, Robert Kenneth. Carboxylate metals process. 3,955,961, Cl. 75-.50R.
Jorn, Raoul; and Reichardt, Peter. Prestressed composite spring element. 3,955,808, Cl. 267-152.000.
Josef Martin Feuerungsbau GmbH: *See—*
Martin, Walter Josef; and Weiand, Heinz, 3,955,512.
Joseph Lucas (Industries) Limited: *See—*
Glaze, Stanley George; and Simmons, John Richard, 3,955,783.
Jost, Max, to Ciba-Geigy Corporation. Anthraquinone dyestuffs. 3,956,324, Cl. 260-368.000.
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Jumberca, S.A.: *See—*
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Jung, Dietrich. Apparatus and process for binding books with molten adhesive. 3,956,057, Cl. 156-578.000.
Jusko, Josef: *See—*
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Juskowiak, Ulrich: *See—*
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Jyo, Yoshio; and Inokuchi, Kyouzi, to Nippon Zeon Co., Ltd. Process for the surface treatment of synthetic resin shaped articles with alkyl hypohalites. 3,956,569, Cl. 428-412.000.
K. C. Pen Co., Inc.: *See—*
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Kaehling, Joachim: *See—*
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Kakiuchi, Tokuzi; and Tanaka, Atsuyuki, to Minolta Camera Kabushiki Kaisha. Electrophotographic copying apparatus. 3,955,888, Cl. 355-1.000.
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Kalmanson, Samuel. Aircraft tow bar device. 3,955,832, Cl. 280-476.00R.

Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, to L'Oreal. 4-[4-(2,6-Diaminopyridylimino)]-2,5-cyclohexadien-1-one. 3,956,342, Cl. 260-296.00R.

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Kammann, Wilfried. Side wall printing apparatus for containers of non-circular cross-section. 3,955,495, Cl. 101-38.00A.

Kampe, Anders; and Vingsbo, Olof, to Aktiebolaget C. E. Johansson. Method of making measuring elements such as gauge blocks. 3,956,092, Cl. 204-192.000.

Kanagawa, Shuichi: *See—*
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Kanbe, Yoshio; Ishii, Takao; Nagatomo, Kazuo; Fujiyama, Hirohisa; and Takino, Tsuyoshi, to Nippon Steel Corporation. Method for welding iron steel and nonferrous alloy. 3,956,610, Cl. 219-137.0PS.

Kanda, Tatsuo: *See—*
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Kansai Paint Co., Ltd.: *See—*
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Kanzaki Paper Manufacturing Co., Ltd.: *See—*
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Takao, Katsuji; and Otsubo, Koji, 3,956,571.

Kapstad, Odd B. Clip for securing signage to a variety of supports. 3,955,296, Cl. 40-11.00R.

Kapstad, Odd B. Poster display frame. 3,955,298, Cl. 40-152.000.

Kardos, Otto; Arcilesi, Donald A.; and Valayil, Silvester P., to M & T Chemicals Inc. Electrodeposition of copper. 3,956,078, Cl. 204-52.00R.

Kardos, Otto; Arcilesi, Donald A.; and Valayil, Silvester P., to M & T Chemicals Inc. Electrodeposition of copper. 3,956,079, Cl. 204-52.00R.

Kardos, Otto; Arcilesi, Donald A.; and Valayil, Silvester P., to M & T Chemicals Inc. Electrodeposition of copper. 3,956,084, Cl. 204-52.00R.

Kardos, Otto; Arcilesi, Donald A.; and Valayil, Silvester P., to M & T Chemicals Inc. Electrodeposition of copper. 3,956,120, Cl. 204-52.00R.

Karev, Boris Dmitrievich: *See—*
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Katchman, Arthur, to General Electric Company. Polyphenylene ethers composition containing N,N'-di-β-naphthyl-P-phenylene diamine stabilizer. 3,956,423, Cl. 260-874.000.

Kato, Hirosi; and Maekawa, Nobuyuki, to Dainichi-Nippon Cables, Ltd. Polyolefin composition for electrical insulation. 3,956,420, Cl. 260-827.000.

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Keppler, Hans Georg; and Wesslau, Hermann, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Agglomerating aqueous dispersions of synthetic rubber. 3,956,218, Cl. 260-29.70D.
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King, Larry K.; Knapp, Lester L.; Schoener, Ronald C.; Kloap, Nicholas; Starner, Bernard M.; and Remper, John A., to Aluminum Company of America. Recovery of solid selectively constituted high purity aluminum chloride from hot gaseous effluent. 3,956,455, Cl. 423-136.000.
King, Robert W., to Avco Corporation. Apparatus for fabricating three-dimensional fabric material. 3,955,602, Cl. 139-11.000.
King, William James; Murray, Leo Thomas; and Salzmann, Gerhard Martin, to Colgate-Palmolive Company. Dentifrice composition. 3,956,478, Cl. 424-52.000.
King, William James: *See—*
Dichter, Michael; Mangaraj, Durydehan; and King, William James, 3,956,480.
Kinik, Mukerrem; and Eroglu, Yalcin A. Shelving apparatus. 3,955,510, Cl. 108-111.000.
Kinoshita, Shoichi: *See—*
Arai, Yoshi; Kinoshita, Shoichi; Kimura, Kazuo; Wada, Tomio; Yamamoto, Hisashi; and Funada, Fumiaki, 3,956,168.
Kippenbrock, Dieter: *See—*
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Kirchdorfer, Friedrich: *See—*
Schroter, Carl; and Kirchdorfer, Friedrich, 3,955,711.
Kirtley, James L., Jr.; and Wilson, Gerald L., to Massachusetts Institute of Technology. Superconducting machine having flexible shield means operable to protect the superconducting field winding against transients. 3,956,648, Cl. 310-40.00R.
Kiszelly, Eniko: *See—*
Magdanyi, Laszlo; Petocz, Lujza; Kiszelly, Eniko; Kosoczky, Ibolya; and Varga, Attila, 3,956,312.
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Pittet, Alan Owen; and Klaiber, Erich Manfred, 3,956,393.
Klappert, Willi. Core steel stacking machine. 3,955,264, Cl. 29-203.00L.
Kleber, Eugene V.; and Recht, Howard L., to Rockwell International Corporation. Removal of phosphate from waste water. 3,956,118, Cl. 210-45.000.
Kleber, Rolf: *See—*
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Mekenitsky, Shimon-Semen Yankelevich; Gorbatov, Vasily Matveevich; Grigoriev, Vladimir Stepanovich; Zaitsev, Vikenty Petrovich; Ionov, Alexei Grigorievich; Khromov, Vyacheslav Ivanovich; Shvachko, Ivan Platonovich; and Klimtsov, Lev Vasilievich, 3,955,376.
Klinchuch, John F., to Rockwell International Corporation. Mass unbalance modulation pickoff attenuation and speed control in electrostatic gyroscope system. 3,955,426, Cl. 74-5.60D.
Kline, Larry Harold: *See—*
Baumrind, Stephen J., 3,955,789.
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Klockner-Werke AG: *See—*
Dawihl, Walter; and Eicke, Walter, 3,955,962.
Knapp, Alfons. Distributing member having a resiliently backed lamellar skirt, for mixing valves. 3,955,598, Cl. 137-625.410.
Knapp, Alfons. Thermostatic mixer for hydraulic systems. 3,955,759, Cl. 236-12.00R.
Knapp, Lester L.: *See—*
King, Larry K.; Knapp, Lester L.; Schoener, Ronald C.; Kloap, Nicholas; Starner, Bernard M.; and Remper, John A., 3,956,455.
Knechtel, Wilhelm, to Canon Kabushiki Kaisha. Transfer-fixing device. 3,955,530, Cl. 118-60.000.
Kneips, Dean F.: *See—*
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Knell, Martin, to Ciba-Geigy Corporation. Process for the addition of perfluoroalkyl iodides to gaseous halogenated olefins. 3,956,412, Cl. 260-653.10T.
Knepper, Siegfried; Arnheim, William M., III; and Grenner, Lawrence John, to Kark Finke OHG; and Inmont Corporation, part interest to each. Liquid colorant dispersions for plastics. 3,956,008, Cl. 106-308.00B.
Knight, Sheldon A.; and Daehler, Max, to Quantic Industries, Inc. Correlation spectrometer. 3,955,891, Cl. 356-74.000.
Knobloch, James O., to Standard Oil Company. Process for sulfuric acid purification. 3,956,373, Cl. 260-515.00A.
Knollenberg, Robert G. Method and apparatus for generating a statistical basis. 3,956,616, Cl. 235-92.0CC.
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Knorre, Helmut: *See—*
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Kobayashi, Teruo; Sueyoshi, Tohru; Sugiyama, Masatoshi; and Sawaguchi, Hiroshi, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive member with backing layer. 3,955,984, Cl. 96-84.00R.

Kobzina, John W., to Chevron Research Company. Herbicidal N-(3-cyano-4-alkylthien-2-yl) ureas. 3,956,315, Cl. 260-332.20A.

Koch, Carl; and Gfeller, Karl, to Sinar AG Schaffhausen. Shutter device for a photographic camera. 3,956,761, Cl. 354-255.000.

Koch, Hans-Joachim: *See—*
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Koelliker, Hans Peter: *See—*
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Koff, Fred W., to Allied Chemical Corporation. Purification of chloronitrosocyclohexane dimer (CNCD). 3,956,410, Cl. 260-647.000.

Koh-I-Noor Rapidograph, Inc.: *See—*
Jozat, Walter, 3,955,894.

Kohkoku Chemical Industry Co. Ltd.: *See—*
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Kollmorgen Corporation: *See—*
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Kollonitsch, Janos, to Merck & Co., Inc. 3-Fluoro-D-alanine and pharmacologically acceptable esters, and pharmacologically acceptable salts thereof. 3,956,367, Cl. 260-482.00R.

Komatsu, Fumito; and Isaka, Akihiko, to Sankyo Seiki Mfg. Co., Ltd. Automatic stop mechanism for tape recorder. 3,955,776, Cl. 242-191.000.

Komoto, Hiroshi; Toyomoto, Kazuo; Ohmura, Kaoru; Ito, Kenji; and Sekiguchi, Hideo, to Asahi Kasei Kogyo Kabushiki Kaisha. Epoxy resin composition including amide derivative of 4-aminomethyl-1,8-diaminooctane. 3,956,239, Cl. 260-47.0EN.

Komoto, Hiroshi: *See—*
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Komusin, Bruce: *See—*
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Kondo, Akihiro: *See—*
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Konno, Nagayoshi, to Koritsu Kikaikogyo Co., Limited. Coke oven cleaner. 3,955,232, Cl. 15-93.00A.

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Todd, Donald V., 3,956,100.
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Kosholkin, Valery Nikolaevich: *See—*
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Koste, Walter W.; and Urfer, Ernest N., to International Business Machines Corporation. Recessed metallurgy for dielectric substrates. 3,956,052, Cl. 156-247.000.

Kostylev, Alexandr Dmitrievich; Gurkov, Konstantin Stepanovich; Rozhkov, Leonid Georgievich; Tkach, Khaim Berkovich; Tanov, Evgeny Ivanovich; and Ploschadny, Viktor Yakovlevich. Soil sampler. 3,955,631, Cl. 175-20.000.

Kovac, James J.; Hillhouse, Mial T.; Seikel, David M.; and Ramsey, Richard L., to Goodyear Aerospace Corporation. Duo material carbon composite brake disk. 3,956,548, Cl. 428-64.000.

Koyama, Aiichiro: *See—*
Tanaka, Kazuo; Okuno, Youichi; Matsumoto, Kazuya; Koyama, Aiichiro; Kawamura, Tomoaki; and Kiyohara, Takehiko, 3,956,584.

Kozawa, Akiya, to Union Carbide Corporation. Primary electric current-producing dry cell using a $(CF_x)_n$ cathode and an aqueous alkaline electrolyte. 3,956,018, Cl. 136-102.000.

Krackeler, Joseph J.; and Biddell, William G., to National Distillers and Chemical Corporation. Insulated high voltage wire coated with a flame retardant composition and process of preparing the same. 3,956,567, Cl. 428-379.000.

Kraftco Corporation: *See—*
Goldbach, Raymond A., 3,956,518.

Kramer, Milton H., to D S C Industries, Inc. Seat construction. 3,955,224, Cl. 5-347.000.

Kratochvil, Miroslav, to R.M.C. Transport (New South Wales) Pty. Limited. Kilns. 3,955,917, Cl. 432-106.000.

Krauch, Carl Heinrich; Sanner, Axel; Jakobi, Guenter; and Schmadel, Edmund, to Henkel & Cie G.m.b.H. Washing process with acid monomer grafted cellulose fabric in bath to absorb metal cations hardening water. 3,955,920, Cl. 8-137.000.

Kraus Instruments, Inc.: *See—*
Kraus, Ronald G., 3,956,741.

Kraus, Ronald G., to Kraus Instruments, Inc. Bi-directional zero radius auto-fire probe and amplifier. 3,956,741, Cl. 340-199.000.

Krause, Horst-Jurgen, to Henkel & Cie G.m.b.H. Method for preparation of ether polycarboxylic acids. 3,956,381, Cl. 260-535.00P.

Krause, Horst-Jurgen, to Henkel & Cie G.m.b.H. Process for the production of ether polycarboxylic acids. 3,956,382, Cl. 260-535.00P.

Krause, Horst-Jurgen; and Tischbirek, Gunther, to Henkel & Cie G.m.b.H. Method for manufacturing ether polycarboxylic acids. 3,956,383, Cl. 260-535.00P.

Krautkramer-Branson, Incorporated: *See—*
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Krems-Chemie Gesellschaft m.b.H.: *See—*
Prey, Vinzenz, 3,956,278.

Kress, Thomas J., to Eli Lilly and Company. Process for bromination of pyrimidine. 3,956,301, Cl. 260-251.00R.

Kropac, Joseph M., to Xerox Corporation. Manifold imaging member and process employing a metal soap. 3,955,975, Cl. 96-1.00M.

Krotov, Andrei Ivanovich: *See—*
Ozeretskovskaya, Natalia Nikolaevna; Karnaukhov, Vladimir Kuzmich; Bronshtein, Alexandr Markusovich; Gladkikh, Vera Fedorovna; Lebedeva, Marina Nikolaevna; Sazonova, Elvira Vasilievna; Lychko, Nelli Dmitrievna; Krotov, Andrei Ivanovich; Kuznetsova, Olga Evgenievna; Bekhli, Alla Fedorovna; Braude, Maria Borisovna; Bolotina, Ljubov Alexeevna; Polovinchik, Renata Leonidovna; and Astafiev, Boris Alexandrovich, 3,956,369.

Kruger, Gerd: *See—*
Pieper, Helmut; Kruger, Gerd; Keck, Johannes; Noll, Klaus-Reinhold; and Kaehling, Joachim, 3,956,492.

Kruger, Jack L. Connecting means for radio frequency transmission line. 3,955,871, Cl. 339-92.00R.

Kruglikov, Anatoly Abramovich; Yakovenko, Zemfira Ivanovna; Roznina, Marina Ivanovna; Rogacheva, Anna Malofeevna; and Belousov, German Ivanovich. Method of preparing silver catalyst for synthesis of formaldehyde by oxidizing methyl alcohol. 3,956,184, Cl. 252-443.000.

Krusche, Erwin; Ribka, Joachim; and Stier, Eberhard, to Cassella Farbwerke Mainkur Aktiengesellschaft. Fast, brown sulfur dyestuffs and process for the preparation thereof. 3,956,332, Cl. 260-282.000.

Kruzell, George R. Bolt operating and locking mechanism for closed breech rocket gun. 3,955,470, Cl. 89-185.000.

Krzewinski, Henrietta K.; and Gorrie, Thomas M., to Johnson & Johnson. Surgical drape. 3,955,569, Cl. 128-132.00D.

Kubelka, Axel R.; Schweizer, Gottfried; and Svoboda, Josef, to Gertsch AG. Holding mechanism for ski boots. 3,955,825, Cl. 280-618.000.

Kubilos, Charles A., to Abex Corporation. Actuator average pressure maintenance in closed loop system. 3,955,369, Cl. 60-445.000.

Kucherer, Gerhard: *See—*
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Kudinov, Nikolai Alexeevich: *See—*
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Kuffner, Karl; Meier, Ernst; and Glockner, Hans, to AGFA-Gevaert, A.G. Process for the preparation of 3-anilino-pyrazolones-(5). 3,956,311, Cl. 260-310.00A.

Kufner Textilwerke KG.: *See—*
Hefele, Josef, 3,956,213.

Kugelfischer Georg Schafer & Co.: *See—*
Schuster, Friedrich, 3,955,350.

Kuhls, Jurgen; Fitz, Herbert; and Haasemann, Peter, to Hoechst Aktiengesellschaft. Fluorocarbon waxes and process for producing them. 3,956,000, Cl. 106-270.000.

Kuhlthau, Hans-Peter: *See—*
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Kuhn, Wayne H.: *See—*
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Kuhns, Roberta B.: *See—*
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Kuki, Michio: *See—*
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Kumagai, Naoki, to Itogihan Company, Ltd. Apparatus for supplying thin, flat articles. 3,955,686, Cl. 214-1.00Q.

Kuntschik, Lawrence Frank: *See—*
Rigdon, Orville Wayne; Kuntschik, Lawrence Frank; and Edwards, Robert Sammie, 3,956,389.

Kurahashi, Masayuki: *See—*
Nakayama, Shozo; Kurahashi, Masayuki; and Kato, Kimio, 3,955,899.

Kuraray Co., Ltd.: *See—*
Abe, Hiroshi; Kazitani, Koichi; Saito, Koichi; and Nakamoto, Hisashi, 3,956,222.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
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Murayama, Naohiro; Katto, Takayuki; Iizuka, Yo; and Sakagami, Teruo, 3,956,424.

Kurei, Hiroshi: *See—*
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Kurtz, Arthur P.: *See—*
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Kurtz, Joseph M., to GTE Sylvania Incorporated. One-piece internal support for a cathode ray tube multipack container. 3,955,675, Cl. 206-419.000.

Kusche, David W., to Brunswick Corporation. Cowl apparatus for outboard motors. 3,955,526, Cl. 115-17.000.

Kushida, Raymond O.: *See—*
Houseman, John; Rupe, Jack H.; and Kushida, Raymond O., 3,955,941.

Kusz, Raymond S.: *See—*
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Kuyama, Shimpei: *See—*
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Kuznetsova, Olga Evgenievna: *See—*
Ozeretskovskaya, Natalia Nikolaevna; Karnaukhov, Vladimir Kuzmich; Bronshtein, Alexandr Markusovich; Gladkikh, Vera Fedorovna; Lebedeva, Marina Nikolaevna; Sazonova, Elvira Vasilievna; Lychko, Nelli Dmitrievna; Krotov, Andrei Ivanovich; Kuznetsova, Olga Evgenievna; Bekhli, Alla Fedorovna; Braude, Maria Borisovna; Bolotina, Ljubov Alexeevna; Polovinchik, Renata Leonidovna; and Astafiev, Boris Alexandrovich, 3,956,369.

Kwikform Limited: *See—*
Steele, Raymond Ernest, 3,955,644.

Kyorin Seiyaku Kabushiki Kaisha: *See—*
Irikura, Tsutomu, 3,956,328.

Kyvsgaard, Erik Bach. Flexible tube pump. 3,955,902, Cl. 417-477.000.

L. M. Cox Manufacturing Co., Inc.: *See—*
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La Bate, Micheal Donald. Expendable tundish liner. 3,955,721, Cl. 222-566.000.

Labavia-S.G.E.: *See—*
Lagarde, Roger, 3,956,722.
Lemonnier, Daniel Claude, 3,955,654.

Lacefield, William B., to Eli Lilly and Company. 2,4-Diaminoquinazolines as antithrombotic agents. 3,956,495, Cl. 424-251.000.

Lacy, James C.: *See—*
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Lacy, James G.: *See—*
Byrne, John; and Lacy, James C., 3,956,678.

Lagarde, Roger, to Labavia-S.G.E. Eddy current retarder control device. 3,956,722, Cl. 335-103.000.

La Haye, Paul G.: *See—*
Craig, Glenn D.; Feuling, David T.; and La Haye, Paul G., 3,955,909.

Laliberte, Albert J.; and DeAngelis, Armand, to Omnitech Inc. Method of coating articles. 3,956,540, Cl. 427-430.000.

Lamanna, Richard A.; and Stephens, Dwight L., to Mobil Oil Corporation. Water-soluble acidic polyesters and thermosetting water-based coatings containing them. 3,956,215, Cl. 260-29.40R.

Lampe, Warren R.: *See—*
Hamilton, Stephen B., Jr.; and Lampe, Warren R., 3,956,209.

Lance, David George: *See—*
Clarke, Brian James; Hildebrand, Robert Peter; Lance, David George; White, Alexander William; and Skinner, Raymond Neil, 3,956,513.

Landau, Richard E. Methods and apparatus for flowing archable materials. 3,955,717, Cl. 222-195.000.

Landi, Vincent Russell; and Easterbrook, Eliot K., to Uniroyal Inc. Halogenation of EPDM in solution in the presence of epoxide and, optionally, poly(alkylene ether) glycol. 3,956,247, Cl. 526-42.000.

Landsman, Douglas A.; and Thiery, Edward I., to United Technologies Corporation. Precisely-structured electrochemical cell electrode and method of making same. 3,956,014, Cl. 136-86.00D.

Lang, Gerard, to Societe Anonyme dite: L'Oreal. Azo derivatives or pyridine N-oxide for use in hair dye compositions. 3,955,918, Cl. 8-10.000.

Lange, Howard G., to Zenith Radio Corporation. Method for making a color selection mask for a color cathode ray tube. 3,955,980, Cl. 96-36.000.

Langley Hill Quarry: *See—*
Dempsey, James G., 3,956,137.

Lanz, Paul: *See—*
Furlenmeier, Andre; Quitt, Peter; Vogler, Karl; and Lanz, Paul, 3,956,323.

Lanz, Philippe: *See—*
Greenwood, Kurt; and Lanz, Philippe, 3,955,349.

Large, George B.; and Pitt, Leland S., to Stauffer Chemical Company. Insecticidal phthalimidothiophosphates activated with certain phosphorothionates. 3,956,486, Cl. 424-200.000.

Larker, Hans; and Nilsson, Jan, to Allmanna Svenska Elektriska Aktiebolaget. High pressure apparatus having means for detecting a leakage. 3,956,604, Cl. 200-61.080.

Larson, William M., to Goodyear Tire & Rubber Company, The. Method of centrifugally casting a tire. 3,956,448, Cl. 264-138.000.

Laurent, Henry; Wiechert, Rudolf; Mengel, Klaus; and Wendt, Hans, to Schering Aktiengesellschaft. Novel pregnanoic acid derivatives. 3,956,347, Cl. 260-397.100.

Lautenberger, William Jacob, to Du Pont de Nemours, E. I., and Company. Thixotropic cleaning composition containing particulate resins and fumed silica. 3,956,162, Cl. 252-162.000.

Lauwasser, Albert B., to Litton Industrial Products, Inc. Rotating anode X-ray tube. 3,956,653, Cl. 313-60.000.

Lauzier, Rene, to Cegedur GP. Protective railing device. 3,955,799, Cl. 256-21.000.

Lavallee, Francois A.: *See—*
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Lawrence Peska Associates, Inc.: *See—*
Wasserman, Saul Z., 3,955,870.

Lawson, Ernest E., Jr., to Exxon Production Research Company. Method for measuring the vertical height and/or density of drilling fluid columns. 3,955,411, Cl. 73-155.000.

Laybourn, Peter: *See—*
Sellars, Keith; Laybourn, Peter; and Chandler, Leslie, 3,956,206.

Leahy, Henry C., to Westinghouse Electric Corporation. Electromagnetic wave communication system with variable polarization. 3,956,699, Cl. 325-15.000.

Lear Siegler, Inc.: *See—*
Franco, Melvin A., 3,955,327.
Frankiw, Walter; and Kusz, Raymond S., 3,955,472.

Leary, Bruce; and Lubbock, Frederick John, to Dulux Australia Ltd. Coating compositions comprising derivatives of autoxidizable maleinized fatty acids. 3,956,210, Cl. 260-21.000.

Lebedeva, Marina Nikolaevna: *See—*
Ozeretskovskaya, Natalia Nikolaevna; Karnaukhov, Vladimir Kuzmich; Bronshtein, Alexandr Markusovich; Gladkikh, Vera Fedorovna; Lebedeva, Marina Nikolaevna; Sazonova, Elvira Vasilievna; Lychko, Nelli Dmitrievna; Krotov, Andrei Ivanovich; Kuznetsova, Olga Evgenievna; Bekhli, Alla Fedorovna; Braude, Maria Borisovna; Bolotina, Ljubov Alexeevna; Polovinchik, Renata Leonidovna; and Astafiev, Boris Alexandrovich, 3,956,369.

LeBrasse, Gordon J.; and Beebe, Austin H., Jr., to Federal-Mogul Corporation. Heavy-duty aluminum bearing alloy. 3,955,936, Cl. 29-197.000.

Leco Industries Limited: *See—*
St. Eve, Daniel R.; and Bose, Ajit Kumar, 3,956,254.

LeCocq, Andrew D., to Texas Instruments Incorporated. Watch having positioned controlled display actuator. 3,955,356, Cl. 58-50.00R.

Lee, Do Ik, to Dow Chemical Company, The. Pigmented detergents. 3,956,163, Cl. 252-171.000.

Lee, Leonard S.; Siegel, Howard M.; and Sopp, Samuel W., to Merck & Co., Inc. Coatings for ferrous substrates. 3,956,030, Cl. 148-27.000.

Lee, Lester T. C.; Ho, Win-Sow; and Liu, Kang-Jen, to Allied Chemical Corporation. Membrane solvent extraction. 3,956,112, Cl. 210-22.00C.

Lee, Seth, Jr. Fuel heat generator for internal combustion engines. 3,955,546, Cl. 123-122.00E.

Leech, Edward J.: *See—*
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Leesona Corporation: *See—*
Pitts, Thomas E., 3,955,664.

Legille, Edouard; and Mahr, Rene N., to S.A. des Anciens Etablissements Paul Wurth. Method and apparatus for cooling and cleaning the sealing surface of a valve. 3,955,693, Cl. 214-35.00R.

le Goascoz, Vincent: *See—*
Audaire, Luc; Borel, Joseph; le Goascoz, Vincent; and Poujois, Robert, 3,956,624.

Leister, Harry M.: *See—*
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Lemonnier, Daniel Claude, to Labavia-S.G.E. Hydraulic retarder and mounting structure therefor. 3,955,654, Cl. 188-296.000.

Leng, John Lindley; and Newton, David Frederick, to Imperial Chemical Industries Limited. Monoazo hydroxy pyridone dyestuffs containing a methylene piperidino group. 3,956,265, Cl. 260-156.000.

Leo Pharmaceutical Products Ltd.: *See—*
Binderup, Ernst Torndal; Petersen, Hans Jorgen; and Liisberg, Sven, 3,956,279.

Leonard, Didier: *See—*
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Levinson, Harold N.; and Frank, Jan. Method of improving ocular fixation, sequential scanning and reading activity in dysmetric dyslexic children. 3,955,564, Cl. 128-76.500.
Levy, David H. Permanently knotted necktie and method of making same. 3,955,217, Cl. 2-150.000.
Lewis, Barbara, administratrix: *See—*
Lewis, Sheldon H., deceased, 3,956,483.
Lewis, J. Stephen: *See—*
Dunn, Ralph; Lewis, J. Stephen; and Phillips, Mellie M., 3,955,587.
Lewis, John A., to Ford Motor Company. Engine deceleration vacuum differential valve control. 3,955,364, Cl. 60-290.000.
Lewis, Richard Newton, to SWS Silicones Corporation. Antistructure agent. 3,956,166, Cl. 252-182.000.
Lewis, Sheldon H., deceased (by Lewis, Barbara, administratrix), to Wilson Pharmaceutical & Chemical Corporation. Preparing pancreatin. 3,956,483, Cl. 424-94.000.
Lewis, William H., Jr., to Lockheed Aircraft Corporation. Detection apparatus for structural failure in aircraft employing piezoelectric transducers. 3,956,731, Cl. 340-27.00R.
Leyman, Edward: *See—*
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Leypold, Dieter; and Maier, Bruno, to Siemens Aktiengesellschaft. Radar system comprising a primary radar device and a secondary radar device. 3,956,747, Cl. 343-6.00R.
Libbey-Owens-Ford Company: *See—*
Fern, Robert W.; and Kimura, Robert B., 3,955,336.
Hansen, Ralph C.; Vande Water, Rae E.; and Sherwin, Owen W., 3,955,676.
Libenson, Mark Naumovich: *See—*
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Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
Fischer, Horst; and Pschunder, Willi, 3,956,765.
Licht, Harry, to Bunker Ramo Corporation. Electrical socket and socket contact adapted for use therewith. 3,955,869, Cl. 339-32.00R.
Lierke, Ernst-Gunther, to Organisation Europeenne de Recherches Spatiales. Infrared radiation modulator. 3,955,880, Cl. 350-160.00R.
Life Support, Inc.: *See—*
Thompson, Tommy Lewis, 3,955,931.
Liisberg, Sven: *See—*
Binderup, Ernst Torndal; Petersen, Hans Jorgen; and Liisberg, Sven, 3,956,279.
Lin, Stephen Y., to Westvaco Corporation. Lignin adducts. 3,956,261, Cl. 260-124.00A.
Lind, Hanns, to Ciba-Geigy Corporation. N-(3-hydroxyaryl-propyl)-imides. 3,956,298, Cl. 260-248.0NS.
Lindelef, Helen M.: *See—*
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Lindelef, Wesley H.; and Lindelef, Helen M. Convertible top carrier-living compartment storage unit for passenger vehicles. 3,955,731, Cl. 224-42.10E.
Lindenman, Gerald A., to Hughes Aircraft Company. Staggered stage shunt regulator. 3,956,687, Cl. 323-8.000.
Linderman, William A.: *See—*
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Linderman, William J.: *See—*
Watson, Paul H.; and Linderman, William J., 3,955,398.
Lindsay, Jeffrey. Modular building system. 3,955,328, Cl. 52-73.000.
Lindstrom, Olle B. Agglomerates of metal-coated diamonds in a continuous synthetic resinous phase. 3,955,324, Cl. 51-298.00R.
Link, Edwin A., to RTE Corporation. Fault interrupter. 3,956,721, Cl. 335-6.000.
Linn, Bruce O.: *See—*
Shen, Tsung-Ying; Greenwald, Richard B.; Jones, Howard; Linn, Bruce O.; and Witzel, Bruce E., 3,956,363.
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Lisle, Thomas K., Jr.; Beard, Jerome C.; and Balma, Thomas W., to Westinghouse Electric Corporation. Successively ranged A/D converter with error correction. 3,956,746, Cl. 340-347.0AD.
Litster, Janet E.: *See—*
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Little, Carl H., to Weber-Knapp Company. Cam operated spring biased counterbalance hinge mechanism for cabinet lid or the like. 3,955,241, Cl. 16-180.000.
Littlewood, Peter Stuart: *See—*
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Litton Industrial Products, Inc.: *See—*
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Loev, Bernard, to SmithKline Corporation. 5-Heterocyclic-1,2,3,6-tetrahydro-4(5H) pyrimidinone. 3,956,325, Cl. 260-256.40C.
Loev, Bernard, to SmithKline Corporation. 1,3,5-Tricarbo-1,4-dihydropyridines. 3,956,341, Cl. 260-295.50R.
Loev, Bernard, to SmithKline Corporation. Pharmaceutical compositions and methods of inhibiting gastric acid secretion. 3,956,494, Cl. 424-248.000.
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Logan, Terry E.: *See—*
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Logothetis, Anestis Leonidas, to Du Pont de Nemours, E. I., and Company. Alternating copolymers of ethylene/alkyl acrylates/cure-site monomers and a process for their preparation. 3,956,248, Cl. 526-219.000.
Lohness, William F., to Vaco Products Company. Hand-held spin-type driver tool. 3,955,451, Cl. 81-177.00R.
Loison, Robert. Centrifugal separating apparatus. 3,955,758, Cl. 233-20.00R.
Lonza Ltd.: *See—*
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Loomis, Phillip Eugene; and Morgan, Joe Pierce, to AMP Incorporated. Apparatus for closing clam-shell housings. 3,955,275, Cl. 29-628.000.
Looney, Joseph M.: *See—*
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Loss, Rudolf; Berini, Rene; Hiestand, Armin; Hofmann, Peter; and Nachbur, Hermann, to Ciba-Geigy Corporation. Process for flame-proofing organic fibre material. 3,956,243, Cl. 260-67.60R.
Lowry, Ralph A., to United States of America, Energy Research and Development Administration. Ultracentrifuge for separating fluid mixtures. 3,955,757, Cl. 233-19.00R.
Loya, Andrew, to Bell Telephone Laboratories, Incorporated. Methods for making semiconductor devices. 3,955,270, Cl. 29-580.000.
Lozier, Gerald Scott, to RCA Corporation. Metal plated or platable article. 3,956,535, Cl. 427-305.000.
LSB Industries, Inc.: *See—*
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Lu, Shui Ting. Tape cassette. 3,955,778, Cl. 242-194.000.
Lubbock, Frederick John: *See—*
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Schroeck, Calvin William, 3,956,354.
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Ludder, Rodney E.: *See—*
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Luebkemann, Leroy, to Fiat-Allis Construction Machinery, Inc. Track roller with open cell plastic foam in lubrication cavity. 3,955,646, Cl. 184-12.000.
Luetzelschwab, Wayne E.: *See—*
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Lund, Robert S., to Pettibone Corporation. Foundry mold conveyor system. 3,955,613, Cl. 164-130.000.
Lundquist, Joseph Theodore, Jr.; Veltman, Preston Leonard; and Woodruff, Edward Theodore, to W. R. Grace & Co. Method for drying fructose solutions. 3,956,009, Cl. 127-62.000.
Lundy, Jack W., to Esquire, Inc. Enclosed box-like housings. 3,955,702, Cl. 220-4.00F.
Lunn, William H. W., to Eli Lilly and Company. Process for producing 7-acylamido-7-alkoxycephalosporins. 3,956,286, Cl. 260-243.00C.
Lunsford, Max W.: *See—*
Dickensheets, William E.; Harrison, Robert S.; Lunsford, Max W.; Medrick, John D.; Nowroski, Alvin P.; and Weslock, Charles K., 3,956,434.
Luscher, Jakob, to Battelle Memorial Institute. Energizing circuit with insulated-gate field-effect transistors for crystal oscillator. 3,956,714, Cl. 331-116.00R.
Luther, Hans Werner; and Bender, Peter, to Rheinmetall G.m.b.H. Propulsive-charge case. 3,955,506, Cl. 102-43.00P.
Lutz, Alfons; and Bienert, Horst, to Webasto-Werk W. Baier KG. Automobile roof with pivotable vent panel. 3,955,848, Cl. 296-137.00B.
Lutz, Eugen: *See—*
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Lychko, Nelli Dmitrievna: *See—*
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Lyon, Richard Francis, to Bell Telephone Laboratories, Incorporated. Two's complement pipeline multiplier. 3,956,622, Cl. 235-164.000.

Lyons, Paul Anthony; and Clark, William Frederick, to Lesney Products & Co., Ltd. Mechanism for moving an upper appendage of a toy figure. 3,955,311, Cl. 46-119.000.

M & J Valve Company: *See—*
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M & T Chemicals Inc.: *See—*
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Kardos, Otto; Arcilesi, Donald A.; and Valayil, Silvester P., 3,956,084.
Kardos, Otto; Arcilesi, Donald A.; and Valayil, Silvester P., 3,956,120.

Mabuchi, Kenichi; and Tsuchimochi, Yoshihisa, to Mabuchi Motor Co. Ltd. Battery cassette power source device. 3,956,019, Cl. 136-132.000.

Mabuchi Motor Co. Ltd.: *See—*
Mabuchi, Kenichi; and Tsuchimochi, Yoshihisa, 3,956,019.

MacDonald, Edward J.: *See—*
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MacDonald, Kenneth A.; and MacDonald, Edward J. Molded foldable cabinet. 3,955,864, Cl. 312-258.000.

MacDonald, Somerled; and Mathesius, Walther H., to Koppers Company, Inc. Process for making steel. 3,955,964, Cl. 75-13.000.

Machida, Keisuke; and Tachi, Katsuichi, to Sony Corporation. Signal recording and/or reproducing apparatus with phase shifting to reduce signal amplitude at overlap points. 3,956,767, Cl. 360-22.000.

MacLeay, Ronald E.: *See—*
Sheppard, Chester S.; and MacLeay, Ronald E., 3,956,269.

MacNamara, John, to Algoma Steel Corporation, Limited, The. Treatment of steel. 3,955,967, Cl. 75-58.000.

Madsen, Ronald N.: *See—*
Johnson, Harry G.; and Madsen, Ronald N., 3,956,063.

Maecker, Kurt. Electric copying control device for chip removing machine tools. 3,956,680, Cl. 318-578.000.

Maekawa, Nobuyuki: *See—*
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Maeyashiki, Masayuki: *See—*
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Maezawa, Yoshiharu: *See—*
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Magdanyi, Laszlo; Petocz, Lujza; Kiszelly, Eniko; Kosoczky, Ibolya; and Varga, Attila, to Egyt Gyogyszervegyeszeti Gyar. Indazole-3-carboxylic acid hydrazides and a process for the preparation thereof. 3,956,312, Cl. 260-310.00C.

Magdo, Ingrid E.; and Magdo, Steven, to International Business Machines Corporation. Dielectrically isolated Schottky Barrier structure and method of forming the same. 3,956,527, Cl. 427-84.000.

Magdo, Ingrid Emese; and Magdo, Steven, to International Business Machines Corporation. Fabricating high performance integrated bipolar and complementary field effect transistors. 3,955,269, Cl. 29-577.000.

Magdo, Steven: *See—*
Magdo, Ingrid E.; and Magdo, Steven, 3,956,527.
Magdo, Ingrid Emese; and Magdo, Steven, 3,955,269.

Mageli, Orville L.; Noller, David C.; and McKellin, Wilbur H., to Pennwalt Corporation. Safe diacyl peroxide solution compositions. 3,956,396, Cl. 260-610.00D.

Magnolo, Peter: *See—*
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Magorian, William Ray, to United States of America, Navy. Bearing measurement device for a portable attack warning radar. 3,956,749, Cl. 343-16.00R.

Mahan, John E.; and Norell, John R., to Phillips Petroleum Company. Alkylation of vinylidene chloride and vinylidene bromide. 3,956,411, Cl. 260-648.00R.

Mahoney, Frank A.; and Fonte, Raymond J., to Sperry Rand Corporation. Type band idler pulley mechanism. 3,955,500, Cl. 101-111.000.

Mahr, Rene N.: *See—*
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Maier, Alfred E.: *See—*
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Maier, Bruno: *See—*
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Maier, Elmar; and Tilg, Robert, to Hilti Aktiengesellschaft. Magazine for a fastening element setting gun. 3,955,674, Cl. 206-347.000.

Maione, Albert. Pneumatic percussor. 3,955,563, Cl. 128-53.000.

Maisuradze, Ledi Alexeevna: *See—*
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Tsygankov, Mikhail Stepanovich; Bitjutskaya, Nina Alexandrovna; Fateeva, Vera Nikonorovna; Kosholkin, Valery Nikolaevich; Karev, Boris Dmitrievich; Kudinov, Nikolai Alexeevich; Kholkin, Mars Mikhailovich; Moiseev, Nikolai Nikiforovich; and Malandin, Oleg Georgievich, 3,956,021.

Malaysian Rubber Producers Research Association, The: *See—*
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Malen, Charles: *See—*
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Malmberg, Paul R.; Handy, Robert M.; Stoneburner, Donald F.; and Green, David, to Westinghouse Electric Corporation. Contactless test method for integrated circuits. 3,956,698, Cl. 324-158.00R.

Malone, David C. Low pressure dispensing apparatus with air pump. 3,955,720, Cl. 222-396.000.

Manaenkov, Valery Ivanovich: *See—*
Artemov, Lev Nikolaevich; Bilyavsky, Anatoly Arkadievich; Vivsik, Stanislav Nikolaevich; Zozulya, Nikolai Vasilievich; Manaenkov, Valery Ivanovich; Moskvichev, Viktor Fedorovich; and Fadeev, Evgeny Alexeevich, 3,955,620.

Mancuso, Ettore J., Jr.: *See—*
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Manderscheid, Peter, to Volkswagenwerk Aktiengesellschaft. Combustion engine with at least one exhaust gas cleaning arrangement. 3,955,363, Cl. 60-277.000.

Manfredi, Arthur F. Electro-magnetic road hazard eliminator for vehicles. 3,956,111, Cl. 209-215.000.

Mangaraj, Durydehan: *See—*
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Mannard, Allan: *See—*
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Marans, Nelson S., to W. R. Grace & Co. Detergent and bleaching agent comprising sodium perborate and sodium α-glucoheptonate and sodium β-glucoheptonate. 3,956,157, Cl. 252-95.000.

Marathon Oil Company: *See—*
Coleman, John R., Jr.; Plummer, Mark A.; Zimmerman, Carle C., Jr.; Pietrzak, Henry J.; Luetzelschwab, Wayne E.; Robinson, Kent W.; and Schroeder, Donald E., Jr., 3,956,372.

Marconi Company Limited, The: *See—*
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Marcus, Harris L., to Texas Instruments Incorporated. Magnetic materials and the formation thereof. 3,956,031, Cl. 148-103.000.

Maremont Corporation: *See—*
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Marendaz, Georges-Andre, to Ateliers des Charmilles S.A. Pulse generator for electro-erosion machining apparatus. 3,956,609, Cl. 219-69.00P.

Marine Colloids, Inc.: *See—*
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Mariner, William Huffington. Container closure. 3,955,707, Cl. 220-243.000.

Mariol, James F.: *See—*
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Markezich, Ronald L., to General Electric Company. Preparation of 4-fluorophthalic anhydride. 3,956,321, Cl. 260-346.300.

Markus, Richard L.; Hidden, William P.; and Hefler, Daniel F., to Milford Rivet & Machine Company, The. Hydraulically operated riveting machine. 3,955,739, Cl. 227-1.000.

Marolewski, Theodore A.; and Timony, Peter E., to Stauffer Chemical Company. Hydraulic fluid system. 3,956,154, Cl. 252-78.000.

Marouby, Guy, to Societe Anonyme D.B.A. Electronic control unit for an antiskid brake system of a vehicle. 3,955,854, Cl. 303-21.0BE.

Marquez, Joseph A.: *See—*
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Marshall, Paul W.; Beaver, Darrell F.; and Thomas, Lawrence M. Container lid with integral removable eating utensil. 3,955,742, Cl. 229-1.50C.

Martelli, Francois, to Societe Alsacienne de Constructions Mecaniques de Mulhouse. Looms provided with means for making movement thereof uniform. 3,955,603, Cl. 139-446.000.

Martin, Gordon D., to Aeros Instruments, Inc. Disposable cap and float assembly. 3,955,572, Cl. 128-275.000.

Martin, Walter Josef; and Weiand, Heinz, to Josef Martin Feuerungsbau GmbH. Refuse incinerator. 3,955,512, Cl. 110-8.00R.

Martinetz, Johann, to Mayer & Cie. Device for changing threads in circular knitting machines. 3,955,382, Cl. 66-134.000.

Martinsons, Aleksandrs: *See—*
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Martz, Lyle F.; and Plotnick, Richard J., to Westinghouse Electric Corporation. Combined cycle electric power plant and a heat recovery steam generator with improved fluid level control therefor. 3,955,358, Cl. 60-39.18B.

Mary, Jacques; and Merillou, Pierre, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Facsimile apparatus with reciprocating printing bar. 3,956,754, Cl. 346-74.00E.

Massachusetts Institute of Technology: *See—*
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Kirtley, James L., Jr.; and Wilson, Gerald L., 3,956,648.

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Massy, Derek James Rowland: *See—*
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Masuda, Shungi: *See—*
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Material Distributors Corporation: *See—*
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Material Systems Corporation: *See—*
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Mathais, Henri: *See—*
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Mathesius, Walther H.: *See—*
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Matiskella, John Daniel: *See—*
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Matsukawa, Hiroharu: *See—*
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Matsumoto, Kazuya: *See—*
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Matsushita Electric Industrial Co., Ltd.: *See—*
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Ohshima, Nobumasa; Himeno, Kinya; Tani, Norihiro; and Enoki, Yoshio, 3,956,526.
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Yagi, June; Nakamura, Harutoki; and Maezawa, Yoshiharu, 3,956,185.
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Mayer, Simon Ernest, to Kuhns, Roberta B. Data bearing card having an aesthetic, magnetizable, colorless, transparent coating thereon. 3,955,295, Cl. 40-2.200.

Mayne, David R. Mailing device. 3,955,751, Cl. 229-73.000.

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McGuigan, Brian; Dellar, Richard John; and Phillips, William David, to Ciba-Geigy Corporation. Antioxidant composition. 3,956,289, Cl. 260-243.00A.

McIntosh, Frank H. Dome loudspeaker. 3,956,599, Cl. 179-115.50R.

McKean, Herbert B., to Potlatch Corporation. Load carrying member constructed of oriented wood strands and process for making same. 3,956,555, Cl. 428-106.000.

McKee, Allan W., Jr.; and Witman, Jack H., to Armstrong Cork Company. Method of making chemically embossed surface coverings. 3,956,530, Cl. 427-195.000.

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McWhinnie, George G.; and Pomian, Joseph P., to Sperry Rand Corporation. Contact start-stop self-elevating air supported magnetic recording head. 3,956,770, Cl. 360-103.000.

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Merrill, Phillip Edward; and Plasko, Emil Robert, to Micro Devices Corporation. Thermally actuatable electrical switch construction. 3,956,725, Cl. 337-407.000.

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Meyer, Daniel Richard, to International Business Machines Corporation. Scavanging apparatus for an electrostatic copier. 3,955,235, Cl. 15-256.520.

Meyer, Georg Michael, to Deutsche Babcock & Wilcox Aktiengesellschaft. Inert gas generator. 3,955,932, Cl. 23-281.000.

Meyer, Hans Rudolf. Distyrylbenzene disulfone derivatives. 3,956,395, Cl. 260-607.00A.

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Millick, William H., III, to Hercules Incorporated. Cooxidation process for the production of dimethyl terephthalate. 3,956,362, Cl. 260-475.00R.

Mimoun, Hubert; Bocard, Christian; and Seree De Roch, Irenee, to Institut Francais du Petrole, des Carburants et Lubrifiants. Process for oxidizing hydrogen sulfide to sulfur by means of molecular oxygen in the presence of transition metal complexes as catalysts. 3,956,473, Cl. 423-573.00R.

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Mitchell, Richard Frank; Read, Eileen; and Stevens, Richard, to U.S. Philips Corporation. Acoustic surface-wave devices using mono crystalline bismuth silicon oxide substrate. 3,956,647, Cl. 310-9.500.

Mitchell, William A.; and Seidel, William C., to General Foods Corporation. Alcohol-containing dextrin powder. 3,956,508, Cl. 426-106.000.

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Modly, Zoltan M., to Kewanee Oil Company. Antimony-free yellow pigments and their preparation. 3,956,007, Cl. 106-300.000.
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Montzka, Thomas Alfred; and Matiskella, John Daniel, to Bristol-Myers Company. 9-Alkoxy-5-methyl-6,7-benzomorphans. 3,956,336, Cl. 260-293.540.
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Moore, Carl O.; Cheng, Hsiung; and Schanefelt, Robert V., to A. E. Staley Manufacturing Company. Edible starch batters. 3,956,515, Cl. 426-302.000.
Moore, Earl P., Jr.; and Vurlicer, Ginter, to Du Pont de Nemours, E. I., and Company. Process for preparing stable positively charged alumina coated silica sols and product thereof. 3,956,171, Cl. 252-313.00S.
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Murakami, Kunihiko; and Ogura, Toshiaki, to Banzai Jidosha Co., Ltd. Method of inspecting conditions of parts of electrical ignition type engines and apparatus therefor. 3,956,689, Cl. 324-16.00S.

Murakami, Ryuzo; Kato, Shigeaki; and Mitarashi, Hiroshi, to Shunan Petrochemical Company, Ltd. Process for preparing nitrogen-containing heterocyclic compounds. 3,956,329, Cl. 260-268.0SY.

Murakami, Yukio: *See—*
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Murase, Yasuhiro; Ito, Mitsuji; Izawa, Nobuharu; and Matsui, Masahiro, to Teijin Limited. System for transporting a filament- bundle from a spinning process to a successive drawing process. 3,955,906, Cl. 425-88.000.

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Murayama, Noboru, to Ricoh Co., Ltd. System for reducing the transmission time of similar portions of visible images. 3,956,580, Cl. 178-6.000.

Murphy, David T., to Winnebago Industries, Inc. Reversible seat apparatus. 3,955,846, Cl. 296-65.00R.

Murray, James G., to Mobil Oil Corporation. Organic reinforcing fillers for silicone rubber. 3,956,419, Cl. 260-827.000.

Murray, Leo Thomas: *See—*
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Muto, Shigeaki; Masuda, Shungi; Nomaguchi, Kanemasa; Tanaka, Hisao; and Kochi, Hiromi, to Hitachi Chemical Company, Ltd. Alkyd-type resin composition containing chelate compound having catalytic activity. 3,956,211, Cl. 260-22.0CA.

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Myers, John L.; and Singleton, David L., to Textron, Inc. Flush type floor box. 3,956,573, Cl. 174-48.000.

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Neely, Raymond J., to Refreshment Machinery Incorporated. Valve. 3,955,795, Cl. 251-129.000.

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Neilson, Robert George Tomison; and Fawcett, John Anthony, to Rank Organisation Limited, The. Optical elements. 3,955,882, Cl. 350-164.000.

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Nemecz, Erno; Ujhidy, Aurel; Borlai, Oszkar; Polinszky, Karoly; Szepvolgyi, Janos; Szekely, Tamas; Szabo, Laszlone; and Riederauer, Szilard, to Toth Aluminum Corporation. Process for producing aluminum trichloride. 3,956,454, Cl. 423-136.000.

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Neufeld, Alonzo J. Tool and method for use in total hip implant. 3,955,568, Cl. 128-92.00E.

Neuworth, Martin B., to Continental Oil Company. Alkylidenedithiobisphenols. 3,956,359, Cl. 260-470.000.

Neville, James J.; Ferrell, Wesley; and Schichman, Daniel, to Uniroyal Inc. Zero degree belted tires, and high soft stretch belt-forming tapes therefor. 3,956,546, Cl. 428-43.000.

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Ogawara, Yoshiaki, to Sony Corporation. Astable multivibrator having adjustable pulse width at constant frequency. 3,956,713, Cl. 331-113.00R.

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Okuda, Yoshizo. Diaper. 3,955,575, Cl. 128-284.000.

Okuno, Youichi: *See—*
Tanaka, Kazuo; Okuno, Youichi; Matsumoto, Kazuya; Koyama, Aiichiro; Kawamura, Tomoaki; and Kiyohara, Takehiko, 3,956,584.

Okuyama, Shinichi: *See—*
Daigo, Koji; Okuyama, Shinichi; and Oda, Kyuzo, 3,956,476.

Olander, Walter K., to General Electric Company. Preparation of polyphenylene oxide using a manganese (II) ω-hydroxyoxime chelate reaction promoter. 3,956,242, Cl. 260-47.0ET.

Olin Corporation: *See—*
Capuano, Italo A., 3,956,094.
Parikh, Prakash D.; and Shapiro, Eugene, 3,956,027.
Scardera, Michael; and Scott, Robert N., 3,956,401.

Olin, John F., to Monsanto Company. Dithiocarbamate hydrochloride salts and their manufacture. 3,956,384, Cl. 260-545.00R.

Olsen, Harry G.: *See—*
Boudrot, Robert J.; Olsen, Harry G.; and Halbich, Frederick, 3,955,534.

Olstowski, Franciszek; and Parrish, Donald B., to Dow Chemical Company, The. Rapid setting non-elastomeric polyurethane compositions containing a non-hydroxyl containing ester-modified polyoxylkylene compound. 3,956,221, Cl. 260-31.600.

Oltra, Claude H.: *See—*
Bubley, Henry J.; and Oltra, Claude H., 3,955,501.

Omark Industries, Inc.: *See—*
Pierson, William F., 3,955,279.

Omni Equipment, Inc.: *See—*
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Omura, Satoshi: *See—*
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Oneyama, Naotake; and Fujitani, Hidetsuugu, to Shoketsu Kinzoku Kogyo Kabushiki Kaisha. Poppet type change-over valve assembly. 3,955,597, Cl. 137-625.250.

Onishi, Kazuo: *See—*
Morinaga, Shigeki; Onishi, Kazuo; Abukawa, Toshimi; and Kawamata, Syoichi, 3,955,273.

Onsager, Olav Torgeir, to Halcon International, Inc. Dimerization method. 3,956,358, Cl. 260-465.80D.

Ontario Research Foundation: *See—*
Brown, Earle C.; and Jones, J. Dennis, 3,956,534.

Ontel Corporation: *See—*
Ophir, David; Shapiro, Marvin; and Komusin, Bruce, 3,956,739.

Ooms, Leo Frans Maria, to U.S. Philips Corporation. Electric incandescent lamp. 3,956,660, Cl. 313-222.000.

Ophir, David; Shapiro, Marvin; and Komusin, Bruce, to Ontel Corporation. Data transfer system. 3,956,739, Cl. 340-172.500.

Optel Corporation: *See—*
Astle, Brian, 3,955,353.
Luce, Nunzio A., 3,955,355.
Witzke, Horst; and Miller, Matthew D., 3,955,879.

Orain, Michel, to Societe Anonyme dite: Glaenzer Spicer. Oscillating bearing supports. 3,955,861, Cl. 308-189.00R.

Orbit Laboratories, Inc.: *See—*
Hryhorczuk, Dmytro, 3,956,691.

Ordonez, Guido A.: *See—*
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Organisation Europeenne de Recherches Spatiales: *See—*
Lierke, Ernst-Gunther, 3,955,880.

Orke, George Gustav: *See—*
Imberg, Bengt Uno; and Orke, George Gustav, 3,956,608.

Orlandi, John F., to Belden Corporation. Wire cabler. 3,955,348, Cl. 57-13.000.

Orlando, Charles M.; and Lavallee, Francois A., to General Electric Company. Brominated biphenols. 3,956,403, Cl. 260-620.000.

Ort, Morris R., to Monsanto Company. Catalyst for the polymerization of olefins. 3,956,255, Cl. 526-352.000.

Ortho Pharmaceutical Corporation: *See—*
Asculai, Samuel Simon, 3,955,923.

Osakabe, Yoshio; Ishizaka, Koichi; and Satoh, Sumio, to Sony Corporation. Balance control system for multichannel audio apparatus. 3,956,709, Cl. 330-124.00R.

Osband, Arthur Norman; Gray, Frederick William; and Jervert, Jon C., to Colgate-Palmolive Company. Cleansing of fabrics. 3,956,156, Cl. 252-95.000.

Osborne, Thomas A.: *See—*
Chamness, Dale L.; and Osborne, Thomas A., 3,955,578.

Oshima, Katsutoshi. Method for melting and cracking amorphous polyolefin. 3,956,414, Cl. 260-683.00R.

Oshima, Takeo: *See—*
Tomita, Kahei; Oshima, Takeo; Toda, Takashi; and Ikemi, Mituo, 3,955,340.

Ostermayer, Franz: *See—*
Wilhelm, Max; Eichenberger, Kurt; Schroter, Herbert; and Ostermayer, Franz, 3,956,335.

Osterwalder, Jean-Pierre F. Speed reducing device. 3,955,445, Cl. 74-805.000.

O'Sullivan, Kenneth J.: *See—*
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Otsubo, Koji: *See—*
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Ottenhoff, Conrad Henry: *See—*
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Ottenhues, Ludger; Schlaupitz, Wolfgang; and Kippenbrock, Dieter. Vacuum-lifting apparatus. 3,955,843, Cl. 294-64.00R.

Ouchi, Hiromu; Nishida, Masamitsu; and Numata, Kazunori, to Matsushita Electric Industrial Co., Ltd. Method of preparing ferroelectric ceramics. 3,956,150, Cl. 252-62.900.

Outboard Marine Corporation: *See—*
Holtermann, Theodore J., 3,955,527.
Zakrzewski, Robert, 3,955,438.

Outlaw, James Raymond; and Gardner, Lewis H. Fishing rod. 3,955,303, Cl. 43-19.200.

Owens-Corning Fiberglas Corporation: *See—*
Bolen, Charles E.; Foley, Kevin M.; and McCombs, Frank Paul, 3,956,565.
Foley, Kevin M.; Muto, Robert L.; and Rastogi, Anil K., 3,956,227.
Roberts, Michael G.; and Chase, Kenneth P., 3,956,421.

Owens-Illinois, Inc.: *See—*
Amberg, Stephen W.; and Ludder, Rodney E., 3,955,699.
Russell, Richard H., 3,956,532.
Uhlig, Albert R., 3,956,441.

Oxley, Gerald K.; and Clendenen, Harold K., to TRW Inc. Power steering gear with proportional flow divider. 3,955,473, Cl. 91-412.000.

Oy Suomen Vanutehdas-Finnwad Ltd.: *See—*
Nordgren, Gunnar, 3,956,048.

Ozark-Mahoning Company: *See—*
Young, Walter L.; Douglas, C. J.; Connally, Carl A.; and Cheek, Robert L., 3,956,061.

Ozeretskovskaya, Natalia Nikolaevna; Karnaukhov, Vladimir Kuzmich; Bronshtein, Alexandr Markusovich; Gladkikh, Vera Fedorovna; Lebedeva, Marina Nikolaevna; Sazonova, Elvira Vasilievna; Lychko, Nelli Dmitrievna; Krotov, Andrei Ivanovich; Kuznetsova, Olga Evgenievna; Bekhli, Alla Fedorovna; Braude, Maria Borisovna; Bolotina, Ljubov Alexeevna; Polovinchik, Renata Leonidovna; and Astafiev, Boris Alexandrovich. N-β-(2-acetyl-4-chlorophenoxy)-ethyl-N,N-dimethyl-N-benzyl-ammonium-p-chlorobenzene sulphonate, method for preparing same and medicinal preparation based thereon. 3,956,369, Cl. 260-501.150.

P.F.W. Beheer B.V.: *See—*
de Haan, Douwe Rienk; and Kettenes, Dirk Karel, 3,956,392.

P. R. Mallory & Co., Inc.: *See—*
Vierow, William F.; and Kallianides, Milton, 3,956,676.

Pacemaker Corporation: *See—*
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Padover, Marvin: *See—*
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Palcher, Joseph John, to Very Important Products, Inc. Rubber and polymer preservative. 3,956,174, Cl. 252-400.00R.

Pall Corporation: *See—*
Campolong, Joseph, 3,955,948.

Palm, Walter C.; and Lyon, James, to Midland-Ross Corporation. Regulator for vehicle leveling systems. 3,955,590, Cl. 137-116.500.

Palmer, Billy W.; and Bondurant, David L., to Eastman Kodak Company. Purification of trimethylolpropane. 3,956,406, Cl. 260-637.00P.

Palmer, Bryan Albert; and Culpin, Michael Frank, to Imperial Chemical Industries Limited. Flocked fabrics and a process for making them. 3,956,553, Cl. 428-90.000.

Panchaud, Paul, to Edouard Dubied et Cie (Societe Anonyme). Straight-line knitting machine, for preselection of the needles, with stitch forwarding. 3,955,381, Cl. 66-75.00R.

Pangborn, Jon B.; and Sharer, John C., to Institute of Gas Technology Catalytic fluid heater. 3,955,556, Cl. 126-362.000.

Panzer, Hans Peter: *See—*
Coscia, Anthony Thomas; Panzer, Hans Peter; and Sedlak, John Andrew, 3,956,122.

Papajewski, Reinhold, to Singer Company, The. Drag link-type feeding mechanism. 3,955,517, Cl. 112-210.000.

Papsdorf, John W., to Cardinal of Adrian, Inc. Punched tape control system. 3,955,736, Cl. 226-6.000.

Paradyne Corporation: *See—*
Harris, Harvey H.; Saliga, Thomas V.; and Smithwick, Luke G., 3,956,601.
Weathers, Luther V.; Saliga, Thomas V.; Looney, Joseph M.; Harris, Harvey H.; and Gardenhour, Cletus L., 3,956,589.

Parikh, Prakash D.; and Shapiro, Eugene, to Olin Corporation. Processing copper base alloys. 3,956,027, Cl. 148-11.50R.

Paritee, Frederick; Alford, John A.; and Reineke, Charles E., to Dow Chemical Company, The. Halogenated-methylbenzyl phenyl ethers. 3,956,399, Cl. 260-612.00R.

Park, Im Keun, to Celanese Corporation. Process for the production of a carbon tape. 3,955,256, Cl. 28-72.00R.

Parker, Kenneth Wade, to N-S-W Corporation. Push-pull power wrench for threaded connectors. 3,955,447, Cl. 81-57.390.

Parker Manufacturing Co.: *See—*
Vecchione, John S., 3,955,395.

Parker, Robert, to RPR, Inc. Compact tubular temperature measuring device. 3,955,420, Cl. 73-356.000.

Parker, William E., to Caterpillar Tractor Co. Viscous damper and method for determining the rotational position of a weight thereof. 3,955,400, Cl. 73-11.000.

Parrish, Donald B.: *See—*
Olstowski, Franciszek; and Parrish, Donald B., 3,956,221.

Parry, David Rees; and Tomlin, Clive Dudley Spencer, to Imperial Chemical Industries Limited. Preparation of N-phosphonomethylglycine. 3,956,370, Cl. 260-502.500.

Particle Technology, Inc.: *See—*
Tucker, Howard E.; Corll, James A.; and Hogg, Walter R., 3,955,436.

Pasternack, George; and Jondahl, Thor P., to Continental Can Company, Inc. Photopolymerizable compounds stabilized against premature gelation with copper compounds and thiocarbamates. 3,956,235, Cl. 260-45.75C.

Patag, Liberate: *See—*
Duft, Buddy L.; Feher, Steven I.; and Patag, Liberate, 3,956,055.

Patch, Robert J.: *See—*
Moulthrop, Le Roy Ellihue, 3,955,922.

Pater, Raymond J. Easy rise bed vibrator device. 3,955,222, Cl. 5-109.000.

Paton, Anthony David, to Imperial Chemical Industries, Inc. Pattern printing apparatus. 3,956,756, Cl. 346-75.000.

Paulson, Peter C.; Henderson, Henri H.; and Worstell, Richard L., to Electro-Coatings, Inc. Apparatus for plating aircraft cylinders. 3,956,096, Cl. 204-237.000.

Pauty, Bernard, to Societe Anonyme Etud. Electrically motor driven can opener. 3,955,276, Cl. 30-4.00R.

Pavlik, Frank J., to Minnesota Mining and Manufacturing Company. Tri (fluoroaliphatic) alpha fluosulfato amines and derivatives thereof. 3,956,293, Cl. 260-246.00B.

Pawlak, Joseph A.: *See—*
Merrifield, D. Bruce; Pawlak, Joseph A.; and Colson, James G., 3,956,428.

Payton, Jo Ann L. Doll house. 3,955,307, Cl. 46-12.000.

Payton, Ralph R., to Raymond Lee Organization Inc., The, a part interest. Process for growing novel plants. 3,955,321, Cl. 47-58.000.

Peabody Galion Corporation: *See—*
Herpich, William A., 3,955,694.

Pearl, David Raymond, to Gerber Garment Technology, Inc. Cutting apparatus with sharpener and sharpening method. 3,955,458, Cl. 83-528.000.

Pedraza, Rafael De Jesus, to Omni Equipment, Inc. Freight container. 3,955,700, Cl. 220-1.500.

Peil, Archie W.: *See—*
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Peninsular & Oriental Steam Navigation: *See—*
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Penland, William Z.: *See—*
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Pennsylvania Engineering Corporation: *See—*
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Pennwalt Corporation: *See—*
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Pennzoil Company: *See—*
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Perkin-Elmer Corporation, The: *See—*
Newell, William H., 3,955,440.

Perkins, Neale A., to Safariland Ltd. Inc. Holster. 3,955,724, Cl. 224-2.00B.

Perraudin, Claude: *See—*
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Peters, Walter B.: *See—*
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Petersen, Arthur: *See—*
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Petersen, Hans Jorgen: *See—*
Binderup, Ernst Torndal; Petersen, Hans Jorgen; and Liisberg, Sven, 3,956,279.

Peterson, Carl W., to International Telephone & Telegraph Corporation. Electrical connector and contacts therefor. 3,955,873, Cl. 339-99.00R.

Peterson, Gerald E.: *See—*
Praska, George J.; Wilson, Daniel W.; and Peterson, Gerald E., 3,955,839.

Petiot, Gerard, to Compagnie Honeywell Bull (Societe Anonyme). Connector. 3,955,875, Cl. 339-176.0MP.

Petocz, Lujza: *See—*
Magdanyi, Laszlo; Petocz, Lujza; Kiszelly, Eniko; Kosoczky, Ibolya; and Varga, Attila, 3,956,312.

Petrocarbon Developments Limited: *See—*
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Pettibone Corporation: *See—*
Lund, Robert S., 3,955,613.

Pettis, Charles R., Jr.; and Del Rosso, Victor, to Hi-Speed Checkweigher Co., Inc. Automatic weighing and labeling machine. 3,955,665, Cl. 198-39.000.

Pevo, Jack L., to Westinghouse Electric Corporation. Ultraviolet radiation source. 3,956,655, Cl. 313-112.000.

Pfizer Inc.: *See—*
Hess, Hans-Jurgen E.; Johnson, Michael R.; Bindra, Jasjit S.; and Schaaf, Thomas K., 3,956,284.

Phaup, Charles W., to Telsco Industries. Sprinkler adjustment. 3,955,764, Cl. 239-206.000.

Phelan, Harry Richard; Jagdmann, Kenneth M.; and Ottenhoff, Conrad Henry, to Harris Corporation. Polarization insensitive lens formed of spiral radiators. 3,956,752, Cl. 343-754.000.

Pheulpin, Jean. Conically walled syringe providing a progressively tighter piston fit. 3,955,719, Cl. 222-386.000.

Phillips, David C.: *See—*
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Phillips, Mellie M.: *See—*
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Phillips Petroleum Company: *See—*
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Cobb, Raymond L., 3,956,356.
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Hunt, Harold R., 3,956,445.
Mahan, John E.; and Norell, John R., 3,956,411.
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Scoggin, Jack S., 3,956,060.
Solomon, Paul W., 3,956,400.
Stapp, Paul R., 3,956,407.
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Phillips, William David: *See—*
McGuigan, Brian; Dellar, Richard John; and Phillips, William David, 3,956,289.

Physical Systems, Inc.: *See—*
Hutter, Charles G., III, 3,955,570.

Piccino, Pierre-Michel; and Moreu Orobitg, Juan-Ramon, to Jumberca, S.A. Knitting machine patterning device. 3,955,380, Cl. 66-50.00R.

Pickard, David Jon: *See—*
Harris, Walter William; and Pickard, David Jon, 3,955,951.

Pieper, Helmut; Kruger, Gerd; Keck, Johannes; Noll, Klaus-Reinhold; and Kaehling, Joachim, to Boehringer Ingelheim GmbH. Pharmaceutical compositions containing a 3-(amino-methylene)-5-phenyl-1,4-benzodiazepin-2-one and method of use. 3,956,492, Cl. 424-244.000.

Pierce, Richard C., to Pierce, Vivian L., a part interest. Obstetrical tool for animals. 3,955,582, Cl. 128-352.000.

Pierce, Vivian L.: *See—*
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Pieroh, Ernst A.: *See—*
Puttner, Reinhold; Roder, Kurt; and Pieroh, Ernst A., 3,956,307.

Pierson, William F., to Omark Industries, Inc. Guide bar for chain saw having a replaceable nose portion. 3,955,279, Cl. 30-384.000.

Pietruszewski, John Joseph: *See—*
Fast, Arlo Wade; Grunert, William Edward; and Pietruszewski, John Joseph, 3,956,124.

Pietrzak, Henry J.: *See—*
Coleman, John R., Jr.; Plummer, Mark A.; Zimmerman, Carle C., Jr.; Pietrzak, Henry J.; Luetzelschwab, Wayne E.; Robinson, Kent W.; and Schroeder, Donald E., Jr., 3,956,372.

Pignocco, Arthur J.: *See—*
Kachik, Robert H.; and Pignocco, Arthur J., 3,956,010.

Pintenich, Brian J.: *See—*
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Pirinoli, Franco: *See—*
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Pirson, Ewald: *See—*
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Bosch, Erhard; Braunsperger, Karl; Gluck, Herbert; Pirson, Ewald; and Roth, Michael, 3,956,570.

Pischke, LaMonte D.: *See—*
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Pisecky, Jan; and Westergaard, Vagn, to Aktieselskabet Niro Atomizer. Process for producing powder from milk or similar liquids. 3,956,521, Cl. 426-588.000.

Pitchford, Armin C., to Phillips Petroleum Company. Retarding skin formation on asphalt in hot storage. 3,956,001, Cl. 106-273.00R.

Pitt, Leland S.: *See—*
Large, George B.; and Pitt, Leland S., 3,956,486.

Pittet, Alan Owen; and Klaiber, Erich Manfred, to International Flavors & Fragrances Inc. Process for preparing alpha-substituted acetaldehydes. 3,956,393, Cl. 260-598.000.

Pitts, Thomas E., to Leesona Corporation. Apparatus for the transfer and alignment of bobbins. 3,955,664, Cl. 198-24.000.

Plasko, Emil Robert: *See—*
Merrill, Phillip Edward; and Plasko, Emil Robert, 3,956,725.

Plastic Graphix Corporation: *See—*
DeZinno, Theophile L., 3,955,681.

Plattier, Marcel; Shimizu, Bernard; and Teisseire, Paul Jose, to Societe Anonyme Roure Bertrand Dupont. Novel odoriferous compositions containing heterocyclic 4,5-decamethylene compounds. 3,956,196, Cl. 252-522.000.

Platz, Rolf: *See—*
Dockner, Toni; and Platz, Rolf, 3,956,387.

Ploschadny, Viktor Yakovlevich: *See—*
Kostylev, Alexandr Dmitrievich; Gurkov, Konstantin Stepanovich; Rozhkov, Leonid Georgievich; Tkach, Khaim Berkovich; Tanov, Evgeny Ivanovich; and Ploschadny, Viktor Yakovlevich, 3,955,631.

Plotnick, Richard J.: *See—*
Martz, Lyle F.; and Plotnick, Richard J., 3,955,358.

Plueddemann, Edwin P., to Dow Corning Corporation. Anionic coupling agents. 3,956,353, Cl. 260-448.80R.

Plummer, Mark A.: *See—*
Coleman, John R., Jr.; Plummer, Mark A.; Zimmerman, Carle C., Jr.; Pietrzak, Henry J.; Luetzelschwab, Wayne E.; Robinson, Kent W.; and Schroeder, Donald E., Jr., 3,956,372.

Plummer, Walter A., III, to Moore Business Forms, Inc. Heat insulating jacket for a conduit equipped with self-locking seam. 3,955,601, Cl. 138-149.000.

Pogoda, Marion C.: *See—*
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Pogonowski, Ivo C.; and Carmichael, Paul D., to Texaco Inc. Method of installing a fixed marine platform with dispersed base. 3,955,372, Cl. 61-46.000.

Pohl, Gerhard: *See—*
Haschke, Heinz; Knorre, Helmut; Morlock, Gerhard; and Pohl, Gerhard, 3,956,121.

Polichette, Joseph; Leech, Edward J.; and Schneble, Frederick W., Jr., to Kollmorgen Corporation. Transfer coating process for manufacture of printing circuits. 3,956,041, Cl. 156-3.000.

Polinszky, Karoly: *See—*
Nemecz, Erno; Ujhidy, Aurel; Borlai, Oszkar; Polinszky, Karoly; Szepvolgyi, Janos; Szekely, Tamas; Szabo, Laszlone; and Riederauer, Szilard, 3,956,454.

Polovinchik, Renata Leonidovna: *See—*
Ozeretskovskaya, Natalia Nikolaevna; Karnaukhov, Vladimir Kuzmich; Bronshtein, Alexandr Markusovich; Gladkikh, Vera Fedorovna; Lebedeva, Marina Nikolaevna; Sazonova, Elvira Vasilievna; Lychko, Nelli Dmitrievna; Krotov, Andrei Ivanovich; Kuznetsova, Olga Evgenievna; Bekhli, Alla Fedorovna; Braude, Maria Borisovna; Bolotina, Ljubov Alexeevna; Polovinchik, Renata Leonidovna; and Astafiev, Boris Alexandrovich, 3,956,369.

Pomfret, Edward E., to Gillette Company, The. Adjustable razor blade unit. 3,955,277, Cl. 30-47.000.

Pomian, Joseph P.: *See—*
McWhinnie, George G.; and Pomian, Joseph P., 3,956,770.

Ponghis, Nicolas Gerassimos; and Poos, Arthur Gerard, to Centre de Recherches Metallurgigues-Centrum voor Research in de Metallurgie. Method of reducing ore. 3,955,963, Cl. 75-40.000.

Pontius, Rex B., to United States of America, Energy Research and Development Administration. Diffusion method of seperating gaseous mixtures. 3,955,943, Cl. 55-16.000.

Poon, Sui Yun; and Tune, George Albert, to Ransome Hoffmann Pollard Limited. Clutch with flexible coupling between release bearing and levers. 3,955,660, Cl. 192-91.00A.

Poos, Arthur Gerard: *See—*
Ponghis, Nicolas Gerassimos; and Poos, Arthur Gerard, 3,955,963.

Popeil Brothers, Inc.: *See—*
Popeil, Samuel J., 3,955,278.

Popeil, Samuel J., to Popeil Brothers, Inc. Cutting board and knife set. 3,955,278, Cl. 30-124.000.

Popp, Ralph, to Westinghouse Air Brake Company. Taper type of battery charger. 3,956,683, Cl. 320-23.000.

Popper, Jakhim B.; and Murteza, Riza E., to LSB Industries, Inc. Apparatus for opening and closing door members and the like. 3,955,661, Cl. 192-150.000.

Pornin, Rene. Adjustable liquid-operated shock-absorber. 3,955,655, Cl. 188-313.000.

Porret, Daniel: *See—*
Batzer, Hans; Habermeier, Juergen; and Porret, Daniel, 3,956,317.
Habermeier, Jurgen; Batzer, Hans; and Porret, Daniel, 3,956,309.

Port, Eugene Baker; and Howard, Carlton James, to Allied Chemical Corporation. Preparation of sodium carbonate monohydrate. 3,956,457, Cl. 423-206.00T.

Portalier, Robert: *See—*
Gauvry, Robert; Portalier, Robert; and Catsaros, Constantin, 3,955,262.

Postelson-Apostolescu, Steven: *See—*
Postelson, Steven, 3,955,780.

Postelson, Steven, to Postelson-Apostolescu, Steven. Flying platform. 3,955,780, Cl. 244-12.00B.

Potlatch Corporation: *See—*
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Poubeau, Pierre, to Societe Nationale Industrielle Aerospatiale. Satellite momentum wheel. 3,955,858, Cl. 308-10.000.

Poujois, Robert: *See—*
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Poulin, Claude: *See—*
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Powell, J. Anthony; and Will, Herbert A., to United States of America, National Aeronautics and Space Administration. Process for fabricating SiC semiconductor devices. 3,956,032, Cl. 148-175.000.

Powell, Orlo A., Jr.; and Roncari, Angelo J., to Urban Research & Development Corporation. Pyrolytic treatment of solid waste materials to form ceramic prills. 3,956,076, Cl. 264-14.000.

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Praska, George J.; Wilson, Daniel W.; and Peterson, Gerald E., to Wright Products, Inc. Door latch. 3,955,839, Cl. 292-226.000.

Prevot, Maurice, to Vallourec Usines a Tubes de Lorraine-Escaut et Vallourec Reunies. Device for changing mandrels in tube rolling mills. 3,955,392, Cl. 72-209.000.

Prey, Vinzenz, to Krems-Chemie Gesellschaft m.b.H. Novel mixed partial esters of carbohydrates. 3,956,278, Cl. 260-234.00R.

Price, Richard T.; Prodell, Rita C.; and Friedman, Stephen B., to Akzona Incorporated. Method and erythrocyte preparation for reverse blood grouping. 3,956,477, Cl. 424-8.000.

Price, Stephen E.: *See—*
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Prichard, Richard J.; and Scott, Jimmie D., to Singer Company, The. Yarn feed roller assembly. 3,955,514, Cl. 112-79.00A.

Priegel, Jack C., to Autotronic Controls Corporation. Post carburetor atomizer. 3,955,545, Cl. 123-119.00E.

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Procter & Gamble Company, The: *See—*
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Proksch, Gary J.; and Bonderman, Dean P. Preparation of optically clear serum. 3,955,925, Cl. 23-230.00B.

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Pugh, William A. G., to General Mills Fun Group, Inc. Gripping hand for dolls. 3,955,312, Cl. 46-163.000.

Pugsley, Peter C., to Crosfield Electronics Limited. Image reproduction systems providing reproduction at a finer pitch than input scanning. 3,956,583, Cl. 178-6.60R.

Pukhov, Alexandr Leonidovich: *See—*
Tupolev, Andrei Nikolaevich; Tupolev, Alexei Andreevich; Nezval, Iosif Fomich; Cheremukhin, Georgy Alexeevich; Sterlin, Alexandr Emmanuilovich; Bliznjuk, Valentin Ivanovich; Pukhov, Alexandr Leonidovich; Svischev, Georgy Petrovich; Bjushgens, Georgy Sergeevich; and Mikeladze, Vitaly Georgievich, 3,955,781.

Pulaski, Albert, to K. C. Pen Co., Inc. Writing instrument with projecting and retracting mechanism. 3,955,893, Cl. 401-106.000.

Pullman, Brian James; Mant, William Denny; and Ross, Gordon Leigh, to ICI Australia Limited; and Canadian Industries, Ltd. Process of making calcium hypochlorite. 3,956,471, Cl. 423-474.000.

Pusch, Gunter; Singer, Heinrich; and Ibrahim, Jutta, to Ciba-Geigy Corporation. Process for the production of textile softeners. 3,956,350, Cl. 260-404.500.

Puttner, Reinhold; Roder, Kurt; and Pieroh, Ernst A., to Schering Aktiengesellschaft. Benzimidazole-1-carboximidic acid esters. 3,956,307, Cl. 260-309.200.

Putzier, Udo; Radke, Dietrich; and Rossner, Heinrich-Otto, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Refining metals. 3,955,965, Cl. 75-52.000.

Pyle, Arlon R.; and Vork, William D., to Graco Inc. Rotatable spray nozzle. 3,955,763, Cl. 239-119.000.

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Quinn, Clayton B.; and Williams, Frank J., to General Electric Company. Dianhydrides of bis-(orthodicarboxyphenyloxyphenyl)acetylene and bis-(ortho-dicarboxyphenyloxyphenyl)2,2-dichloroethylene. 3,956,322, Cl. 260-346.300.

Quirk, James F.; and Green, David, to Westinghouse Electric Corporation. Reinforced seal structure for an electrical penetration. 3,956,577, Cl. 174-151.000.

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R. E. Phelon Company, Inc.: *See—*
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Radcliffe, Arthur J., Jr., to Burroughs Corporation. Platen having a pressure-responsive transducing means for use in a signature-identifying system. 3,956,734, Cl. 340-146.3SY.

Rademachers, Jakob: *See—*
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Raimbault, Roger, to Societe dite Aeropar Societe Anonyme Francaise, a part interest. Rail expansion joint. 3,955,895, Cl. 403-340.000.

Rakoutz, Michel, to Rhone-Poulenc Industries. Process for the preparation of trimethyl-benzoquinone. 3,956,346, Cl. 260-396.00R.

Raleigh Industries Limited: *See—*
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Ramsay, John W. Ground monitor for electrical apparatus. 3,956,639, Cl. 307-94.000.

Ramsey, Jerrold Craig. Self-venting tank valve for toilet tanks. 3,955,218, Cl. 4-56.000.

Ramsey, Richard L.: *See—*
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Rawls, William W.; Buchholz, Alex; and Walsh, John P., to Cornell Iron Works, Inc. Door release mechanism. 3,955,840, Cl. 292-229.000.

Ray, Jimmie A. Wall telephone caddy. 3,956,600, Cl. 179-146.00R.

Raychem Corporation: *See—*
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Raymond, Anthony John. Metallic coating of metal tubes and similar work pieces. 3,956,537, Cl. 427-433.000.

Raymond International Inc.: *See—*
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Raymond Lee Organization Inc., The: *See—*
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Reed, William Carroll: *See—*
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Reisdorf, Bartholomew G., to United States Steel Corporation. Alloy steel for arctic service. 3,955,971, Cl. 75-124.000.

Reiter, Robert C., to Material Control, Inc. Cable operated safety stop switch. 3,956,606, Cl. 200-161.000.

Reitzel, Helen. Contact lens locket. 3,955,726, Cl. 224-5.00R.

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Remabold, Heinz: *See—*
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Remijas, Jerry, to Corporate Products Research. Dog brush. 3,955,238, Cl. 15-402.000.

Remington Arms Company, Inc.: *See—*
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Remper, John A.: *See—*
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Renoux, Charles Simon. Towable flexible marine trailer. 3,955,524, Cl. 114-74.00T.

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Research Corporation: *See—*
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Richards, Lawrence I., to Autoquip Corporation. Swimming pool lift. 3,955,797, Cl. 254-89.00H.

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Bambury, Ronald E.; Edwards, Michael L.; and Miller, Laird F., 3,956,288.
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Riedesel, Ernest H., to Raymond Lee Organization Inc., a part interest. Mattress carrier. 3,955,826, Cl. 280-35.000.
Riem, Roland Hendrick; and Dieterman, Alfred Johannes, to Emery Industries, Inc. Vinyl resins plasticized with mixed mellitate compounds. 3,956,220, Cl. 260-31.600.
Rieter Machine Works, Ltd.: *See—*
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Roberson, Donald K., to Motorola, Inc. Method of fabricating an integrated semiconductor transistor structure with epitaxial contact to the buried sub-collector. 3,956,033, Cl. 148-175.000.
Robert Bosch G.m.b.H.: *See—*
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Roberti, Barney. Multiple ply wood article and method. 3,956,542, Cl. 428-35.000.
Roberts, Albert Lee. Cementitious wall composition and method. 3,955,992, Cl. 106-90.000.
Roberts, Earl F. Universal fishing weight. 3,955,305, Cl. 43-44.910.
Roberts, Michael G.; and Chase, Kenneth P., to Owens-Corning Fiberglas Corporation. Polar thermoplastic additive for molding compounds and molding compound containing same. 3,956,421, Cl. 260-862.000.
Robertshaw Controls Company: *See—*
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Robinson, Kent W.: *See—*
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Rochlitz, Jurgen; and Schon, Gunter, to Hoechst Aktiengesellschaft. Electrophotographic recording material. 3,955,978, Cl. 96-1.500.
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Rohwer, Werner; Wuhle, Alwin; and Roschmann, Klaus, to TED Bildplatten Aktiengesellschaft, AEG-Telefunken, Teldec. Fabrication of foil disc pressing matrices. 3,956,075, Cl. 204-5.000.
Roidt, Robert M.; and Swanson, Bruce W., to Westinghouse Electric Corporation. Fluid blast circuit interrupter with a compact nozzle structure and versatile operating mechanism. 3,956,605, Cl. 200-148.00B.
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Roman, Joseph M.; and Thomas, Albert, to Roman, Joseph M. Boring bar assembly improvement. 3,955,897, Cl. 408-186.000.
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Rubinstein, Morton K. Pumping system for catheter suction units. 3,955,574, Cl. 128-278.000.

Rubinstein, Richard B., to General Instrument Corporation. Buffer amplifier for ripple-carry binary generator. 3,956,640, Cl. 307-205.000.

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Russell, William A. Record holder carrying case. 3,955,733, Cl. 224-45.00K.

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Rusterholz, Otto. Self-contained device for the pneumatic conveyance of incoherent solid materials with a modular takeup device and valve means. 3,955,853, Cl. 302-17.000.

Rutter, Harold T.: *See—*
Sunnen, Robert M.; Siegel, Jerome J.; and Rutter, Harold T., 3,955,571.

Rutz, Peter, to Sulzer Brothers Limited. Hydrostatic piston machine having a guide for laterally guiding a cylinder block pintle. 3,955,477, Cl. 91-497.000.

Ryer, Jack: *See—*
Graham, John P.; Ryer, Jack; and Lestz, Sidney J., 3,955,938.

Rymes, William H., to United States of America, Navy. Omnidirectional tracking weapon control system. 3,956,748, Cl. 343-7.00A.

S. C. Johnson & Son, Inc.: *See—*
Hagarty, John D., 3,956,498.

Saab-Scania Aktiebolag: *See—*
Robertsson, Hans R., 3,955,292.

Sacks, William: *See—*
Bollen, Phillip Stuart; Amin, Surendra A.; and Sacks, William, 3,956,229.

Sacrini, Egeo; and Cavallotti, Claudio, to B. F. Goodrich Company, The. Organic peroxides derived from unsaturated compounds. 3,956,319, Cl. 260-346.10R.

Sado, Ichiro; and Seki, Mitsuaki, to Canon Kabushiki Kaisha. Numeral output system for circulating register. 3,956,744, Cl. 340-324.00R.

Sadowski, Anthony J.: *See—*
Bradley, Robert L.; Sadowski, Anthony J.; and Ballweber, Edward G., 3,956,117.

Saeda, Shigeru; and Suzaka, Yukinori, to Showa Denku K.K. Method for preventing fouling in the polymerization of olefins. 3,956,252, Cl. 526-74.000.

Saeki, Keiso; and Matsukawa, Hiroharu, to Fuji Photo Film Co., Ltd. Process for hardening microcapsules containing hydrophobic oil droplets. 3,956,172, Cl. 252-316.000.

Saettler, Heinz: *See—*
Homilius, Karl; Stoff, Fritz; Saettler, Heinz; and Scharmer, Wolfgang, 3,955,669.

Safariland Ltd. Inc.: *See—*
Perkins, Neale A., 3,955,724.

Safford, Robert D., to Kimberly-Clark Corporation. Tape fastener system for disposable diapers. 3,955,576, Cl. 128-287.000.

Safir, Sidney Robert: *See—*
Crawley, Lantz Stephen; and Safir, Sidney Robert, 3,956,343.

Sagane, Masahiko; and Murai, Koichi, to Kansai Paint Company. Semi-solid emulsion coating composition. 3,955,997, Cl. 106-131.000.

Sagara, Iwao: *See—*
Numata, Saburo; Sagara, Iwao; and Shishikura, Hirohisa, 3,955,892.
Numata, Saburo; Sagara, Iwao; and Shishikura, Hirohisa, 3,956,758.

Sagawa, Seiji; Yamato, Hideo; and Kanagawa, Shuichi, to Sumitomo Chemical Company. Limited. Inhibiting ozone deterioration of rubbers. 3,956,234, Cl. 260-45.90R.

St. Eve, Daniel R.; and Bose, Ajit Kumar, to Leco Industries Limited. Thermoplastic crystalline free films. 3,956,254, Cl. 526-352.000.

Saint-Gobain Industries: *See—*
Tochon, Jean Paul, 3,955,990.

Saito, Kazuo: *See—*
Niwa, Tomizo; Tsuruoka, Takashi; Shomura, Takashi; Inouye, Shigeharu; Saito, Kazuo; and Niida, Taro, 3,956,337.

Saito, Koichi: *See—*
Abe, Hiroshi; Kazitani, Koichi; Saito, Koichi; and Nakamoto, Hisashi, 3,956,222.

Saito, Mamoru: *See—*
Sugahara, Yujiro; Miyazawa, Kaichiro; Hidetika, Okitsu; and Saito, Mamoru, 3,956,005.

Saito, Mitsuo: *See—*
Shino, Makoto; and Saito, Mitsuo, 3,955,642.

Saito, Shinroku, to Shinagawa Firebrick, Co., Ltd. Dry-type isostatic pressing method involving minimization of breaks or cracks in the molded bodies. 3,956,452, Cl. 264-89.000.

Sakagami, Teruo: *See—*
Murayama, Naohiro; Katto, Takayuki; Iizuka, Yo; and Sakagami, Teruo, 3,956,424.

Sakaguchi, Fumio; Suzuji, Tadao; and Yamazaki, Isamu, to Showa Denko Kabushiki Kaisha. Ethylene resin composition. 3,956,212, Cl. 260-23.00H.

Sakaguchi, Keiichi: *See—*
Toyama, Masamichi; Takigawa, Tomoshi; Hirata, Noritsugu; Sakaguchi, Keiichi; and Ichiyanagi, Toshikazu, 3,955,887.

Sakai Chemical Industry Company Ltd.: *See—*
Daigo, Koji; Okuyama, Shinichi; and Oda, Kyuzo, 3,956,476.

Sakamoto, Jyunji; Imaizumi, Norio; and Shiratani, Eisuke, to Tokyo Sanyo Electric Co., Ltd.; and Sanyo Electric Co., Ltd. D.C. power source with temperature compensation. 3,956,661, Cl. 307-297.000.

Sakamoto, Nagayoshi: *See—*
Yoshikawa, Toshio; Sakamoto, Nagayoshi; and Nagamori, Tomitada, 3,956,331.

Sakurai, Yasuhiko, to Nippondenso Co., Ltd. Monitoring system for an automobile light circuit. 3,956,733, Cl. 340-79.000.

Saliga, Thomas V.: *See—*
Harris, Harvey H.; Saliga, Thomas V.; and Smithwick, Luke G., 3,956,601.
Weathers, Luther V.; Saliga, Thomas V.; Looney, Joseph M.; Harris, Harvey H.; and Gardenhour, Cletus L., 3,956,589.

Salkeld, Robert J. Mixed mode propulsion aerospace vehicles. 3,955,784, Cl. 244-172.000.

Salners, Edward A.: *See—*
Hofmeister, Richard J.; and Salners, Edward A., 3,955,449.

Salzmann, Gerhard Martin: *See—*
King, William James; Murray, Leo Thomas; and Salzmann, Gerhard Martin, 3,956,478.

Sandoz, Inc.: *See—*
Hay, Peter M., 3,956,144.
Houlihan, William J.; and Nadelson, Jeffrey, 3,956,391.

Sandoz Ltd.: *See—*
Altermatt, Ruedi, 3,956,268.
Blass, Ulrich; and Entschel, Roland, 3,956,271.
Fleck, Fritz; Littlewood, Peter Stuart; and Mercer, Alec Victor, 3,956,280.
Fleck, Fritz, 3,956,283.

Sangiorgio, Louis: *See—*
Barton, Serge P.; and Sangiorgio, Louis, 3,955,419.

Sankyo Seiki Mfg. Co., Ltd.: *See—*
Komatsu, Fumito; and Isaka, Akihiko, 3,955,776.

Sanmartin, Marie Louise: *See—*
Duguet, Jean Rene; and Sanmartin, Marie Louise, 3,956,038.

Sanner, Axel: *See—*
Krauch, Carl Heinrich; Sanner, Axel; Jakobi, Guenter; and Schmadel, Edmund, 3,955,920.

Santore, Anthony. Bottle stopper. 3,955,712, Cl. 222-80.000.

Sanyo Electric Co., Ltd.: *See—*
Sakamoto, Jyunji; Imaizumi, Norio; and Shiratani, Eisuke, 3,956,661.

Sapko, Alexandr Ivanovich; Prikhodko, Dina Fedorovna; Godetsky, Evgeny Vasilievich; and Borisevich, Anatoly Fedorovich. Device for removal of slag from surface of molten metal. 3,955,805, Cl. 266-228.000.

Sapp, Richard S.: *See—*
McGhee, Harce; and Sapp, Richard S., 3,955,632.

Sardisco, John B.: *See—*
Drechsel, Erhart K.; Sardisco, John B.; and Stewart, James R., Jr., 3,956,464.

Sartory, Walter K.: *See—*
Breillatt, Julian P., Jr.; Remenyik, Carl J.; Sartory, Walter K.; Thacker, Louis H.; and Penland, William Z., 3,955,755.

Sasaki, Mitsuru; Mukai, Kunio; and Tanaka, Katsutoshi, to Sumitomo Chemical Company, Limited, Phosphoryl phenylenediamines. 3,956,429, Cl. 260-938.000.

Sato, Hiroaki: *See—*
Shibayama, Kimio; and Sato, Hiroaki, 3,956,646.

Sato, Masamichi: *See—*
Honjo, Satoru; Matsumoto, Seiji; and Sato, Masamichi, 3,955,976.

Sato, Mikio: *See—*
Nakano, Fumio; Toriyama, Kazuhisa; Nagata, Noboru; and Sato, Mikio, 3,956,169.

Satoh, Sumio: *See—*
Osakabe, Yoshio; Ishizaka, Koichi; and Satoh, Sumio, 3,956,709.

Satter, Abdus: *See—*
Christopher, Charles A., Jr.; and Satter, Abdus, 3,956,145.

Saul, David L., to United States of America, Navy. Miniaturized millimeter wave instantaneous frequency discriminator. 3,956,706, Cl. 328-140.000.

Saunders, Kevin John: *See—*
Northmore, Barry Robert; Saunders, Kevin John; and White, Derek Chester, 3,955,924.

Sawaguchi, Hiroshi: *See—*
Kobayashi, Teruo; Sueyoshi, Tohru; Sugiyama, Masatoshi; and Sawaguchi, Hiroshi, 3,955,984.

Sawyer, Philip Nicholas. Method of preventing thromboses. 3,956,504, Cl. 424-319.000.

Sazonova, Elvira Vasilievna: *See—*
Ozeretskovskaya, Natalia Nikolaevna; Karnaukhov, Vladimir Kuzmich; Bronshtein, Alexandr Markusovich; Gladkikh, Vera Fedorovna; Lebedeva, Marina Nikolaevna; Sazonova, Elvira Vasilievna; Lychko, Nelli Dmitrievna; Krotov, Andrei Ivanovich; Kuznetsova, Olga Evgenievna; Bekhli, Alia Fedorovna; Braude, Maria Borisovna; Bolotina, Ljubov Alexeevna; Polovinchik, Renata Leonidovna; and Astafiev, Boris Alexandrovich, 3,956,369.

Scannell, James P.; Pruess, David L.; and Demny, Thomas C., to Hoffmann-La Roche Inc. Antibiotic X-372A. 3,956,067, Cl. 195-80.00R.

Scardera, Michael; and Scott, Robert N., to Olin Corporation. Low foaming, biodegradable, nonionic surfactants. 3,956,401, Cl. 260-615.00B.

Schaaf, Thomas K.: *See—*
Hess, Hans-Jurgen E.; Johnson, Michael R.; Bindra, Jasjit S.; and Schaaf, Thomas K., 3,956,284.

Schaar, John L.; Ellard, James A.; and Butler, John Mann, to Monsanto Research Corporation. Intumescent compositions and substrates coated therewith. 3,955,987, Cl. 106-15.0FP.

Schacht, Erich; Mehrhof, Werner; Nowak, Herbert; and Simane, Zdenek, to Merck Patent Gesellschaft mit beschrankter Haftung. 2-Methyl-2-[4-(4-piperidinophenyl)-phenoxy]-propionic acid 1-methyl-4-piperidyl ester. 3,956,334, Cl. 260-293.640.

Schaefer, Wolfgang: *See—*
Herbst, Friedrich-Wilhelm; Koch, Hans-Joachim; Schaefer, Wolfgang; Schneider, Dieter; Schunhoff, Kurt; Ullrich, Friedrich; and Wesche, Arnold, 3,955,257.

Schanefelt, Robert V.: *See—*
Moore, Carl O.; Cheng, Hsiung; and Schanefelt, Robert V., 3,956,515.

Schaper, Helmut, to Braunschweigische Maschinenbauanstalt. Continuously operating centrifuge having a plurality of separating screens. 3,955,754, Cl. 233-2.000.

Schappell, Frederick G., to Hercules Incorporated. Bismonoperoxyacetals and -ketals. 3,956,398, Cl. 260-610.00R.

Scharmer, Wolfgang: *See—*
Homilius, Karl; Stoff, Fritz; Saettler, Heinz; and Scharmer, Wolfgang, 3,955,669.

Schausberger, Helmut, to AGFA-Gevaert, A.G. Device for detecting the presence of photographic film as the film travels along a predetermined path through a film processing apparatus. 3,956,764, Cl. 354-298.000.

Scheibitz, Wolfgang: *See—*
Heymer, Gero; Scheibitz, Wolfgang; and Spott, Hasso, 3,956,462.

Scheidel, Wolfgang: *See—*
Frommholz, Wilfried; Scheidel, Wolfgang; and Rubig, Heinz, 3,955,905.

Schell, Raymond A.; and Kehoe, Lawrence J., to Ethyl Corporation. Preparation of unsaturated alcohols. 3,956,408, Cl. 260-638.00R.

Schellenbaum, Max, to Ciba-Geigy Corporation. Substituted bishydroxyphenyl pentanes. 3,956,402, Cl. 260-619.00B.

Schepers, Herman A. J., to Stamicarbon B.V. Process for preparing block copolymers containing alpha-methyl styrene. 3,956,426, Cl. 260-879.000.

Scherenberg, Hans O., to Daimler-Benz Aktiengesellschaft. Rotary piston internal combustion engine. 3,955,539, Cl. 123-8.090.

Schering Aktiengesellschaft: *See—*
Biere, Helmut; Ahrens, Hanns; Rufer, Clemens; Schroder, Eberhard; and Koch, Henning, 3,956,295.
Hilscher, Jean-Claude, 3,956,348.
Laurent, Henry; Wiechert, Rudolf; Mengel, Klaus; and Wendt, Hans, 3,956,347.
Puttner, Reinhold; Roder, Kurt; and Pieroh, Ernst A., 3,956,307.

Schering Corporation: *See—*
Gold, Elijah H.; and Babad, Esther, 3,956,390.
Weinstein, Marvin J.; Wagman, Gerald H.; and Marquez, Joseph A., 3,956,068.

Schetters, Cornelis Wilhelmus Anthonius: *See—*
Verstegen, Judicus Marinus Pieter Jan; van de Spijker, Willebrordus Hubertus Martinus Maria; and Schetters, Cornelis Wilhelmus Anthonius, 3,956,663.

Schichman, Daniel: *See—*
Neville, James J.; Ferrell, Wesley; and Schichman, Daniel, 3,956,546.

Schiowitz, Morton I., to Medi-Cab Inc. of New York. Wheelchair hold down assembly. 3,955,847, Cl. 296-65.00R.

Schippers, Heinz, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Anti-noise structures on multi-position textile machines. 3,955,347, Cl. 57-1.00R.

Schippers, Heinz, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Process for extruding a partially foamed thermoplastic product. 3,956,438, Cl. 264-46.100.

Schirmann, Jean-Pierre: *See—*
Tellier, Pierre; Mathais, Henri; Schirmann, Jean-Pierre; and Weiss, Francis, 3,956,282.

Schirmer, Robert M.; and Fromm, Ellsworth H., to Phillips Petroleum Company. Gas turbine combustor with controlled fuel mixing. 3,955,361, Cl. 60-39.650.

Schlaupitz, Wolfgang: *See—*
Ottenhues, Ludger; Schlaupitz, Wolfgang; and Kippenbrock, Dieter, 3,955,843.

Schlegel Corporation: *See—*
Williams, Fred, 3,955,331.

Schlumberger Technology Corporation: *See—*
Aumann, James T., 3,955,623.

Schmadel, Edmund: *See—*
Krauch, Carl Heinrich; Sanner, Axel; Jakobi, Guenter; and Schmadel, Edmund, 3,955,920.

Schmidt, Andreas, to Ciba-Geigy Corporation. Benzylated phosphoric acid hydrazides. 3,956,427, Cl. 260-923.000.

Schmidt, Robert W. System for indicating when maximum material speed for a predetermined board length is exceeded in a corrugator cut-off machine. 3,956,617, Cl. 235-151.100.

Schneble, Frederick W., Jr.: *See—*
Polichette, Joseph; Leech, Edward J.; and Schneble, Frederick W., Jr., 3,956,041.

Schneider, Dieter: *See—*
Herbst, Friedrich-Wilhelm; Koch, Hans-Joachim; Schaefer, Wolfgang; Schneider, Dieter; Schunhoff, Kurt; Ullrich, Friedrich; and Wesche, Arnold, 3,955,257.

Schniepp, Hans: *See—*
Schuh, Karl; and Schniepp, Hans, 3,955,240.

Schoenemann, Rudolf; and Reitzenstein, Rudolf, to Henkel & Cie G.m.b.H. Surface pretreatment of steel prior to enameling. 3,956,536, Cl. 427-328.000.

Schoener, Ronald C.: *See—*
King, Larry K.; Knapp, Lester L.; Schoener, Ronald C.; Kloap, Nicholas; Starner, Bernard M.; and Remper, John A., 3,956,455.

Schoenholz, Daniel; Petersen, Arthur; and Terry, Herbert, to Foster D. Snell, Inc. Cleaning composition in dry powder form. 3,956,197, Cl. 252-526.000.

Scholle Corporation: *See—*
Scholle, William R., 3,956,012.

Scholle, William R., to Scholle Corporation. Storage battery plates of plastic and lead. 3,956,012, Cl. 136-58.000.

Schommer, Alfred S.: *See—*
Tine, Sebastian David; Dewberry, Albert W.; and Schommer, Alfred S., 3,955,647.

Schon, Gunter: *See—*
Rochlitz, Jurgen; and Schon, Gunter, 3,955,978.

Schouteten, Augustinus P. H.: *See—*
den Otter, Marinus J. A. M.; Hawinkels, Lambertus P. G.; and Schouteten, Augustinus P. H., 3,956,299.

Schramm, Heribert: *See—*
Grozinger, Dieter; Schramm, Heribert; Wunsch, Steffen; and Vogel, Erich, 3,955,628.

Schreyer, Gerd: *See—*
Schwarze, Werner; and Schreyer, Gerd, 3,956,304.

Schroder, Eberhard: *See—*
Biere, Helmut; Ahrens, Hanns; Rufer, Clemens; Schroder, Eberhard; and Koch, Henning, 3,956,295.

Schroeck, Calvin William, to Lubrizol Corporation, The. Method for the preparation of sulfonic acid esters from free sulfonic acids. 3,956,354, Cl. 260-456.00A.

Schroeder, Donald E., Jr.: *See—*
Coleman, John R., Jr.; Plummer, Mark A.; Zimmerman, Carle C., Jr.; Pietrzak, Henry J.; Luetzelschwab, Wayne E.; Robinson, Kent W.; and Schroeder, Donald E., Jr., 3,956,372.

Schroter, Carl; and Kirchdorfer, Friedrich, to Hermann, Heinrich. Dispenser for self-stick strip-carried labels. 3,955,711, Cl. 221-73.000.

Schroter, Herbert: *See—*
Wilhelm, Max; Eichenberger, Kurt; Schroter, Herbert; and Ostermayer, Franz, 3,956,335.

Schuh, Karl; and Schniepp, Hans, to Wilhelm Bahmuller, Maschinen- und Apparatebau, Firma. Multi-position safety lock joint, particularly for folding ladders. 3,955,240, Cl. 16-144.000.

Schuh, Richard: *See—*
Stein, Werner; and Schuh, Richard, 3,956,351.

Schuhbauer, Ernst, to Siemens Aktiengesellschaft. Switching arrangement for switching between different current values by means of mechanical or electronic switches. 3,956,590, Cl. 178-74.000.

Schultheiss, Alfons. Metal melting and casting process. 3,955,612, Cl. 164-62.000.

Schumacher, Ernest W., to Virginia Chemicals Inc. Combination liquid trapping suction accumulator and evaporator pressure regulator device including a capillary cartridge and heat exchanger. 3,955,375, Cl. 62-217.000.

Schunhoff, Kurt: *See—*
Herbst, Friedrich-Wilhelm; Koch, Hans-Joachim; Schaefer, Wolfgang; Schneider, Dieter; Schunhoff, Kurt; Ullrich, Friedrich; and Wesche, Arnold, 3,955,257.

Schurger, Rainer; Walter, Lothar; and Burkl, Erich, to SKF Industrial Trading and Development Company, B.V. Ball box. 3,955,857, Cl. 308-6.00C.

Schuster, Friedrich, to Kugelfischer Georg Schafer & Co. False twister. 3,955,350, Cl. 57-77.400.

Schwartz, Osten, to Aktiebolaget Electrolux. Remote control phase shift circuit for thyristor. 3,956,688, Cl. 323-24.000.

Schwarz, Herbert: *See—*
Hagemann, Hermann; Schwarz, Herbert; and Doring, Fritz, 3,956,089.

Schwarze, Werner; and Schreyer, Gerd, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Preparation of 2-methyl-4-isopropylidene-2-oxazolin-5-one. 3,956,304, Cl. 260-307.00A.

Schweitzer, Robert F.: *See—*
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Schweizer, Gottfried: *See—*
Kubelka, Axel R.; Schweizer, Gottfried; and Svoboda, Josef, 3,955,825.

Schwuger, Milan Johann, to Henkel & Cie G.m.b.H. Textile fibrous cleaning structures. 3,956,155, Cl. 252-91.000.

Science Union et Cie, Societe Francaise de Recherche Medical: *See—*
Beregi, Laszlo; Malen, Charles; Hugon, Pierre; and Duhault, Jacques, 3,956,501.

Scoggin, Jack S., to Phillips Petroleum Company. Removal of reaction diluent from poly(arylene sulfide) reaction slurry. 3,956,060, Cl. 159-47.00R.

Scott, Jimmie D.: *See—*
Prichard, Richard J.; and Scott, Jimmie D., 3,955,514.

Scott-Maxwell, Denis Gordon: *See—*
Holt, Michael George; and Scott-Maxwell, Denis Gordon, 3,956,516.

Scott, Robert N.: *See—*
Scardera, Michael; and Scott, Robert N., 3,956,401.

Scott, Thaddeus LeRoy. Electromagnetically actuated printer. 3,955,498, Cl. 101-93.310.

Scroggs, Dennis I.: *See—*
Smith, Ian E.; and Scroggs, Dennis I., 3,955,533.

Seaman, Russell L.: *See—*
Cresswell, Ronald Morton; Mentha, John W.; and Seaman, Russell L., 3,956,327.

Sebestian, Imrich; and Halasz, Istvan, to Helsaz, Istvan. Process for the chemical modification of surfaces of inorganic solids. 3,956,179, Cl. 252-430.000.

Sedlak, John Andrew: *See—*
Coscia, Anthony Thomas; Panzer, Hans Peter; and Sedlak, John Andrew, 3,956,122.

Seid, Gordon, to Lockheed Aircraft Corporation. Printed circuit modules cooled by rack with forced air. 3,956,673, Cl. 317-100.000.

Seidel, William C.: *See—*
Mitchell, William A.; and Seidel, William C., 3,956,508.
Mitchell, William A.; and Seidel, William C., 3,956,509.
Mitchell, William A.; and Seidel, William C., 3,956,511.

Seiford, Donald S., Sr., to Twin City Shipyard, Inc. Watercraft docking mechanism and method. 3,955,525, Cl. 114-235.00R.

Seikel, David M.: *See—*
Kovac, James J.; Hillhouse, Mial T.; Seikel, David M.; and Ramsey, Richard L., 3,956,548.

Seiner, Jerome A., to PPG Industries, Inc. Article of manufacture having thereon a stable reflective coating containing fluorinated aliphatic ring chain addition polymers. 3,956,201, Cl. 260-2.50M.

Seitz, Martin V.; and Hennen, Harry A., to Motorola, Inc. Phase locked loop lock detector and method. 3,956,710, Cl. 331-1.00A.

Seitz, Peter W.: *See—*
Hughes, Earnest D.; and Seitz, Peter W., 3,955,625.

Seitz-Werke GmbH: *See—*
Born, Gerhard, 3,955,588.

Seki, Michiharu: *See—*
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Seki, Mitsuaki: *See—*
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Sekiguchi, Hideo: *See—*
Komoto, Hiroshi; Toyomoto, Kazuo; Ohmura, Kaoru; Ito, Kenji; and Sekiguchi, Hideo, 3,956,239.

Sellars, Keith; Laybourn, Peter; and Chandler, Leslie. Paints from two or more differently coloured aqueous film-forming polymer emulsions. 3,956,206, Cl. 260-17.00R.

Semenov, Vyacheslav Ivanovich: *See—*
Gaschenko, Viktor Petrovich; Dzhulai, Vladimir Fedorovich; Semenov, Vyacheslav Ivanovich; and Serebryakov, Viktor Alexeevich, 3,955,228.

Sendai, Kyozo: *See—*
Umeda, Haruhiko; Mori, Katsuyoshi; Sendai, Kyozo; and Ikeda, Isao, 3,955,851.

Seragnoli, Enzo, to G. D. Societa per Anzioni. Device for checking that the underneath part or base, particularly of packets of cigarettes and similar, has been properly sealed down. 3,956,110, Cl. 209-82.000.

Serebryakov, Viktor Alexeevich: *See—*
Gaschenko, Viktor Petrovich; Dzhulai, Vladimir Fedorovich; Semenov, Vyacheslav Ivanovich; and Serebryakov, Viktor Alexeevich, 3,955,228.

Seree De Roch, Irenee: *See—*
Mimoun, Hubert; Bocard, Christian; and Seree De Roch, Irenee, 3,956,473.

Serovy, Walter, deceased; and Arnold, Herbert J., administrator. Planter box. 3,955,320, Cl. 47-34.00R.

Sesco Tools AB: *See—*
Gustafsson, Manfred Wallace, 3,955,259.

Setescak, Linda Louise: *See—*
Narayanan, Venkatachala Lakshmi; Setescak, Linda Louise; and Weisenborn, Frank Lee, 3,956,285.

Sexton, Michael David: *See—*
Swietlik, Joseph Marian; and Sexton, Michael David, 3,956,148.

Seybold, Frederick W. Rotary internal combustion engine with uniformly rotating pistons cooperating with reaction elements having a varying speed of rotation. 3,955,541, Cl. 123-8.470.

Seybold, Rolf: *See—*
Evertz, Egon; Seybold, Rolf; and Stracke, Heinz Willi, 3,955,265.

Shaffer, John W.: *See—*
Armstrong, Donald E.; McDonough, Thomas B.; Shaffer, John W.; and Sindlinger, Ronald E., 3,955,912.

Shallenberger, Lester G. Balancing toy with ends of sockets and protrusions. 3,955,814, Cl. 273-1.00R.

Shanahan, Joseph W.: *See—*
Gaudiano, Anthony V.; Hawks, Larry E.; McDole, James E.; and Shanahan, Joseph W., 3,955,522.

Shapiro, Eugene: *See—*
Parikh, Prakash D.; and Shapiro, Eugene, 3,956,027.

Shapiro, Justin Joel. Automatic dilutor having coupled diluent and reagent plungers. 3,955,930, Cl. 23-259.000.

Shapiro, Marvin: *See—*
Ophir, David; Shapiro, Marvin; and Komusin, Bruce, 3,956,739.

Sharer, John C.: *See—*
Pangborn, Jon B.; and Sharer, John C., 3,955,556.

Sharon, Benjamin, to Yeda Research & Development Co. Ltd. Flowmeter. 3,955,415, Cl. 73-228.000.

Sharp Corporation: *See—*
Arai, Yoshi; Kinoshita, Shoichi; Kimura, Kazuo; Wada, Tomio; Yamamoto, Hisashi; and Funada, Fumiaki, 3,956,168.

Sharp Kabushiki Kaisha: *See—*
Shigemasa, Junichiro, 3,956,017.

Sharp, Silas S.: *See—*
Bullock, Greg A.; and Sharp, Silas S., 3,956,303.

Shaw, Wilfrid G.: *See—*
Grasselli, Robert K.; Miller, Arthur F.; and Shaw, Wilfrid G., 3,956,181.

Shell Oil Company: *See—*
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Connolly, David Charles Antony; Hovland, Per Jorgen; and Stevenson, Robert Andrew, 3,956,596.

Stewart, Burgess F.: *See—*
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Stewart, James R., Jr.: *See—*
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Stier, Eberhard: *See—*
Krusche, Erwin; Ribka, Joachim; and Stier, Eberhard, 3,956,332.

Stinger, Kenneth R.: *See—*
McTeague, Gerald E.; and Stinger, Kenneth R., 3,956,662.

Stock, Erwald E. Automatic safety switch. 3,955,535, Cl. 119-27.000.

Stoeberl, Helmut. Boat hull connector and method. 3,956,549, Cl. 428-71.000.

Stoff, Fritz: *See—*
Homilius, Karl; Stoff, Fritz; Saettler, Heinz; and Scharmer, Wolfgang, 3,955,669.

Stoffey, Donald G. System and method for rigid enclosures. 3,955,566, Cl. 128-90.000.

Stoklossa, Kurt: *See—*
Muck, Gustav; Rothbuhr, Lothar; and Stoklossa, Kurt, 3,956,106.

Stone Container Corporation: *See—*
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Blackmore, Kenneth A. E.; and Stout, Albert W., deceased, 3,956,207.

Stout, Zelda M., executrix: *See—*
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Stracke, Heinz Willi: *See—*
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Zaruba, Jiri; Fruehauf, Josef; Mikulik, Jan; and Vodenka, Bohumil, 3,955,691.

Streebin, Leale E.; and Nassef, Namon A. Apparatus for disposing of organic waste materials. 3,956,126, Cl. 210-104.000.

Stromberg-Carlson Corporation: *See—*
Altenburger, Otto; and Soni, Sureshar L., 3,956,592.

Strommer, Palmer K., to General Mills, Inc. Food processing apparatus. 3,955,486, Cl. 99-323.400.

Strubbe, Joseph Honore; and Linz, Raymond Armand, to U.C.B., Societe Anonyme. Derivatives of 2-pyrrolidinone. 3,956,314, Cl. 260-326.5FL.

Strutt & Farrands Ltd.: *See—*
Strutt, Peter; and Lymn, Terrance, 3,956,125.

Strutt, Peter; and Lymn, Terrance, to Strutt & Farrands Ltd. Filtration apparatus. 3,956,125, Cl. 210-94.000.

Strydom, Mauritz L., to Tobacco Research and Development Institute Limited. Non-destructive hardness testing of articles such as cigarettes. 3,955,406, Cl. 73-78.000.

Stryker Corporation: *See—*
Richmond, James W.; and Topf, Jeffrey S., 3,955,567.

Stumpf, Friedrich: *See—*
Wild, Rudolf; Kucherer, Gerhard; and Stumpf, Friedrich, 3,955,334.

Sturgill, James Raymond, to Hi-Ran, Ltd. Underdrain for water filtration system. 3,956,134, Cl. 210-275.000.

Sturm, Elmar; and Cellarius, Hans Jorg, deceased (by Haigermoser, Herta Cellarius, legal representative), to Ciba-Geigy Corporation. Phosphoryl-acylamines for inhibiting plant growth. 3,955,957, Cl. 71-76.000.

Suda, Hideaki; Kanda, Tatsuo; Tomita, Hiroshige; Nakanishi, Hirotoshi; Hida, Hiromu; Nuno, Tatsumi; Akutsu, Seiichi; and Maeyashiki, Masayuki, to Sumitomo Chemical Company, Limited. Process for producing sulfonylamides. 3,956,385, Cl. 260-556.00A.

Suda, Kazuyoshi; Isono, Tomoyuki; and Uematsu, Seiichi, to Nippon Electric Company Limited. Flat-article separating apparatus for an automatic mail handling system and the like. 3,955,812, Cl. 271-64.000.

Sueyoshi, Tohru: *See—*
Kobayashi, Teruo; Sueyoshi, Tohru; Sugiyama, Masatoshi; and Sawaguchi, Hiroshi, 3,955,984.

Sugahara, Yujiro; Noshi, Yoshibumi; Naito, Hiroyuki; and Toki, Katsuya, to Mizusawa Kagaku Kogyo Kabushiki Kaisha. Manufacture of granular lead compounds. 3,956,004, Cl. 106-297.000.

Sugahara, Yujiro; Miyazawa, Kaichiro; Hidetika, Okitsu; and Saito, Mamoru, to Mizusawa Kagaku Kogyo Kabushiki Kaisha. Coated pigment composition having improved abrasion resistance and process for preparation thereof. 3,956,005, Cl. 106-298.000.

Suggitt, Robert M.; Gates, Walter C., Jr.; and Hudson, Ralph B., Jr., to Texaco Inc. Hydrocarbon upgrading process in paraffin oxime production. 3,956,090, Cl. 204-162.0XN.

Sugiyama, Masatoshi: *See—*
Kobayashi, Teruo; Sueyoshi, Tohru; Sugiyama, Masatoshi; and Sawaguchi, Hiroshi, 3,955,984.

Sugiyama, Takahiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Wide angle photographic lens. 3,955,883, Cl. 350-215.000.

Suling, Carlhans: *See—*
Hoffmann, Helmut; and Suling, Carlhans, 3,956,368.

Sulzer Brothers Limited: *See—*
Braun, Rudolf, 3,955,604.
Rutz, Peter, 3,955,477.

Sumitomo Chemical Company, Limited: *See—*
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Sasaki, Mitsuru; Mukai, Kunio; and Tanaka, Katsutoshi, 3,956,429.
Suda, Hideaki; Kanda, Tatsuo; Tomita, Hiroshige; Nakanishi, Hirotoshi; Hida, Hiromu; Nuno, Tatsumi; Akutsu, Seiichi; and Maeyashiki, Masayuki, 3,956,385.

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Summagraphics Corporation: *See—*
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Sun Oil Company of Pennsylvania: *See—*
Hansel, William B., 3,956,439.
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Sunaga, Motonobu: *See—*
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Sunbros Corporation: *See—*
Sunter, Raymond B., 3,955,483.

Sunnen, Robert M.; Siegel, Jerome J.; and Rutter, Harold T., to Emko Company, The. Rechargeable applicator for dispensing substances. 3,955,571, Cl. 128-235.000.

Sunter, Raymond B., to Sunbros Corporation. Quick mounting means for grilles. 3,955,483, Cl. 98-114.000.

Suresh, Dev D.: *See—*
Grasselli, Robert K.; Suresh, Dev D.; and Milberger, Ernest C., 3,956,378.

Surgicot, Inc.: *See—*
Bowen, Leonard C.; and Gallant, Reginald R., 3,956,044.

Sutch, Brian Leo Chudleigh, to Airfix Industries Limited. Composite closure member. 3,956,550, Cl. 428-81.000.

Sutherland, Byron C., to Walker, Hall, Sears, Inc. Coupler for joining three cables. 3,956,575, Cl. 174-87.000.

Suzaka, Yukinori: *See—*
Saeda, Shigeru; and Suzaka, Yukinori, 3,956,252.

Suzuji, Tadao: *See—*
Sakaguchi, Fumio; Suzuji, Tadao; and Yamazaki, Isamu, 3,956,212.

Suzuki, Minoru, to Ricoh Co., Ltd. Device for preventing an image of a printing master from being printed in an inclined position. 3,955,494, Cl. 101-232.000.

Suzuki, Shigeto, to Chevron Research Company. Hydrogenation of epoxides. 3,956,318, Cl. 260-346.10R.

Suzuki, Takeshi, to Minolta Camera Kabushiki Kaisha. Motion picture camera. 3,955,886, Cl. 352-137.000.

Suzuki, Yasuhiko: *See—*
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Hasegawa, Junzo; Kawabata, Susumu; and Suzuki, Yasuhiko, 3,955,384.

Svenska Traforskningsinstitutet: *See—*
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Svensson, Gunther; and Wohler, Hans-Joachim, to Balcke-Durr Aktiengesellschaft. Flow grate structure for cooling towers. 3,956,435, Cl. 261-111.000.

Svischev, Georgy Petrovich: *See—*
Tupolev, Andrei Nikolaevich; Tupolev, Alexei Andreevich; Nezval, Iosif Fomich; Cheremukhin, Georgy Alexeevich; Sterlin, Alexandr Emmanuilovich; Bliznjuk, Valentin Ivanovich; Pukhov, Alexandr Leonidovich; Svischev, Georgy Petrovich; Bjushgens, Georgy Sergeevich; and Mikeladze, Vitaly Georgievich, 3,955,781.

Svoboda, Josef: *See—*
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Swanson, Bruce W.: *See—*
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Swietlik, Joseph Marian; and Sexton, Michael David, to Exxon Research and Engineering Company. Lubricating oil compositions. 3,956,148, Cl. 252-47.500.

SWS Silicones Corporation: *See—*
Lewis, Richard Newton, 3,956,166.

Sybron Corporation: *See—*
Neefe, Donald D., 3,955,225.

Sydnor, James Rawlings. Bar code printing device. 3,955,497, Cl. 101-93.250.

Syntex (U.S.A.) Inc.: *See—*
Gallegra, Pasquale G., 3,956,349.

Szabo, Laszlone: *See—*
Nemecz, Erno; Ujhidy, Aurel; Borlai, Oszkar; Polinszky, Karoly; Szepvolgyi, Janos; Szekely, Tamas; Szabo, Laszlone; and Riederauer, Szilard, 3,956,454.

Szarka Enterprises, Inc.: *See—*
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Szarka, Joseph R.: *See—*
Szarka, Paul J.; and Szarka, Joseph R., 3,955,761.

Szarka, Paul J.; and Szarka, Joseph R., to Szarka Enterprises, Inc. Method for providing a vehicular supporting deck for a railroad grade crossing. 3,955,761, Cl. 238-8.000.

Szekely, Tamas: *See—*
Nemecz, Erno; Ujhidy, Aurel; Borlai, Oszkar; Polinszky, Karoly; Szepvolgyi, Janos; Szekely, Tamas; Szabo, Laszlone; and Riederauer, Szilard, 3,956,454.

Szepvolgyi, Janos: *See—*
Nemecz, Erno; Ujhidy, Aurel; Borlai, Oszkar; Polinszky, Karoly; Szepvolgyi, Janos; Szekely, Tamas; Szabo, Laszlone; and Riederauer, Szilard, 3,956,454.

T.I. (Group Services) Limited: *See—*
Carmichael, Richard Quentin; and Bonelle, Roger George, 3,955,453.

Tachi, Katsuichi: *See—*
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Taff, Frederick Nishwitz: *See—*
Boguslawski, Jan Janusz; Geyer, Paul; and Taff, Frederick Nishwitz, 3,956,056.

Taft, Wayne C.: *See—*
Armstrong, Albert L.; Bakeman, Paul E., Jr.; Woodhull, Joel; Taft, Wayne C.; and Ketola, H. Norman, 3,956,753.

Takagawa, Minoru: *See—*
Fujiyama, Susumu; and Takagawa, Minoru, 3,956,394.

Takagi, Akira: *See—*
Wakabayashi, Takeshi; Takatsuka, Kiyoshi; and Takagi, Akira, 3,955,410.

Takagi, Hiroyuki. Blood pump for use in an artificial heart or such purpose. 3,955,557, Cl. 128-1.00D.

Takahashi, Akio; Smith, Geoffrey H.; and Hopkins, George C., to Hooker Chemicals & Plastics Corporation. Polyester modifiers for vinyl halide polymers. 3,956,422, Cl. 260-873.000.

Takahashi, Kazuhisa: *See—*
Ishii, Takashi; Takahashi, Kazuhisa; and Kondo, Akihiro, 3,956,037.

Takahashi, Noriyuki; Inoue, Hidehiko; and Miyahara, Hiromitsu, to Honda Giken Kogyo Kabushiki Kaisha. Suspension device for a vehicle. 3,955,807, Cl. 267-65.00B.

Takahasi, Isoji; and Matsumoto, Seiji, to Fuji Photo Film Co., Ltd. Electrostatic image forming method and apparatus with controlled discharge of the original member. 3,956,755, Cl. 346-74.0ES.

Takamatsu, Ikuo, to Yoshida Kogyo Kabushiki Kaisha. Slide fastener element construction. 3,955,247, Cl. 24-205.13D.

Takanashi, Iwao: *See—*
Kikuchi, Takayuki; Kawai, Yukihiro; and Takanashi, Iwao, 3,956,627.

Takao, Katsuji; and Otsubo, Koji, to Kanzaki Paper Manufacturing Co., Ltd. Method for making electrostatic recording sheet and resulting product. 3,956,571, Cl. 428-513.000.

Takatsuka, Kiyoshi: *See—*
Wakabayashi, Takeshi; Takatsuka, Kiyoshi; and Takagi, Akira, 3,955,410.

Takei, Haruo: *See—*
Hinata, Masanao; Ohki, Masanaga; Takei, Haruo; and Mihara, Yuji, 3,955,996.

Takemitsu, Shiro, to Wakamizu Sangyo Kabushiki Kaisha. Apparatus for preparing mineral water. 3,956,132, Cl. 210-219.000.

Takenoshita, Mitsuaki; Ichiryu, Ken; Nakamura, Ichiro; Murakami, Yukio; and Yumino, Hiroshi, to Hitachi, Ltd. Device for correcting floor level of hydraulic elevator. 3,955,649, Cl. 187-29.00A.

Takeuchi, Hiroshi: *See—*
Waku, Toshihiko; and Takeuchi, Hiroshi, 3,956,719.

Takigawa, Tomoshi: *See—*
Toyama, Masamichi; Takigawa, Tomoshi; Hirata, Noritsugu; Sakaguchi, Keiichi; and Ichiyanagi, Toshikazu, 3,955,887.

Takino, Tsuyoshi: *See—*
Kanbe, Yoshio; Ishii, Takao; Nagatomo, Kazuo; Fujiyama, Hirohisa; and Takino, Tsuyoshi, 3,956,610.

Tamburello, Russell D., to Bechtel International Corporation. Composite pipeline. 3,955,600, Cl. 138-141.000.

Tanaka, Akio, to International Fastener Establishment. Separable fastener. 3,955,246, Cl. 24-204.000.

Tanaka, Akio, to Zenith Radio Corporation. Band decoder for all-channel digital tuning system. 3,956,702, Cl. 325-459.000.

Tanaka, Atsuyuki: *See—*
Kakiuchi, Tokuzi; and Tanaka, Atsuyuki, 3,955,888.

Tanaka, Hisao: *See—*
Muto, Shigeaki; Masuda, Shungi; Nomaguchi, Kanemasa; Tanaka, Hisao; and Kochi, Hiromi, 3,956,211.

Tanaka, Katsuaki, to Iwatsu Electric Co., Ltd. Compensating circuit for a cold junction of a thermocouple. 3,956,686, Cl. 322-2.00R.

Tanaka, Katsutoshi: *See—*
Sasaki, Mitsuru; Mukai, Kunio; and Tanaka, Katsutoshi, 3,956,429.

Tanaka, Kazuo; Okuno, Youichi; Matsumoto, Kazuya; Koyama, Aiichiro; Kawamura, Tomoaki; and Kiyohara, Takehiko, to Canon Kabushiki Kaisha. Optical system for a television camera with a bias-light emitting device. 3,956,584, Cl. 178-7.200.

Tanaka, Osamu: *See—*
Yamamoto, Takaaki; Tanaka, Osamu; Katoh, Hirotada; and Nakashima, Shozaburo, 3,956,029.

Tanaka, Taro: *See—*
Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Yukiyasu; and Tanaka, Taro, 3,955,538.

Tanaka, Yukiyasu: *See—*
Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Yukiyasu; and Tanaka, Taro, 3,955,538.

Tang, Arthur Y. C., to General Diode Corporation. Diamond wheel mounting assembly. 3,955,551, Cl. 125-15.000.

Tani, Norihiro: *See—*
Ohshima, Nobumasa; Himeno, Kinya; Tani, Norihiro; and Enoki, Yoshio, 3,956,526.

Tanimoto, Tadashi: *See—*
Shibata, Kazuo; and Tanimoto, Tadashi, 3,956,562.

Tanneberger, Rolf, to Bayer Aktiengesellschaft. Packaging container. 3,955,743, Cl. 229-14.0BE.

Tanov, Evgeny Ivanovich: *See—*
Kostylev, Alexandr Dmitrievich; Gurkov, Konstantin Stepanovich; Rozhkov, Leonid Georgievich; Tkach, Khaim Berkovich; Tanov, Evgeny Ivanovich; and Ploschadny, Viktor Yakovlevich, 3,955,631.

Tatara, Shokichi: *See—*
Kawakami, Hirotake; and Tatara, Shokichi, 3,956,598.

Tate, Stanley L.; Rowland, Bobby A.; and Blackstone, Michael M., to Southwire Company. Method of preparing curable pellets of polyethylene with a motionless mixer. 3,956,214, Cl. 260-23.00H.

Taylor, Byron Kent, to RCA Corporation. Pickup arm apparatus. 3,956,581, Cl. 178-6.60R.

Taylor, Clyde L. Multi-row vineyard cultivator. 3,955,626, Cl. 172-6.000.

Taylor, Russell J., Jr., to McNeil Laboratories, Incorporated. Inhibition of gastric acid secretion with 2-(tetrahydrofuryl)perimidine. 3,956,496, Cl. 424-251.000.

Taylor, Russell J., Jr., to McNeil Laboratories, Incorporated. Inhibition of gastric acid secretion with 1-dialkylamidomethyl-2-alkyl perimidines. 3,956,497, Cl. 424-251.000.

Taylor, William Joseph: *See—*
Rogers, Campbell Clifford; and Taylor, William Joseph, 3,955,230.

TED Bildplatten Aktiengesellschaft, AEG-Telefunken, Teldec: *See—*
Rohwer, Werner; Wuhle, Alwin; and Roschmann, Klaus, 3,956,075.

Tee-Pak, Inc.: *See—*
Harrington, Frank C., 3,956,544.
O'Brien, Merrill N., Jr., 3,956,539.

Teich, Rudor M. Automobile theft alarm with ignition controlled automatic arming means. 3,956,732, Cl. 340-64.000.

Teichner, Stanislas; and Echevin, Bernard, to Agence Nationale de Valorisation de la Recherche (ANVAR). Method for the preparation of copper hydroxide and of a catalyst obtained from this hydroxide. 3,956,475, Cl. 423-604.000.

Teijin Limited: *See—*
Murase, Yasuhiro; Ito, Mitsuji; Izawa, Nobuharu; and Matsui, Masahiro, 3,955,906.

Teisseire, Paul Jose: *See—*
Plattier, Marcel; Shimizu, Bernard; and Teisseire, Paul Jose, 3,956,196.

Tektronix, Inc.: *See—*
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Teledyne Industries, Inc.: *See—*
Richards, David W., 3,955,723.

Teletype Corporation: *See—*
Hauser, Anthony J., 3,955,953.

Tellier, Pierre; Mathais, Henri; Schirmann, Jean-Pierre; and Weiss, Francis. Method for preparing azines. 3,956,282, Cl. 260-240.00G.

Telsco Industries: *See—*
Phaup, Charles W., 3,955,764.

Telxon Corporation: *See—*
Jones, Michael Dale; Johnson, David Alan; Wright, Carl Taylor; and Bell, William Sherman, Jr., 3,956,740.

Tenneco Chemicals, Inc.: *See—*
Goodman, Donald; Miller, Robert S.; and Stanaback, Robert J., 3,956,249.

Tensmeyer, Lowell G., to Eli Lilly and Company. Method of killing microorganisms in the inside of a container utilizing a laser beam induced plasma. 3,955,921, Cl. 21-54.00R.

Terada, Haruko: *See—*
Hata, Toju; Omura, Satoshi; Katagiri, Michiko; Awaya, Juichi; Kuyama, Shimpei; Higashikawa, Shizuo; Yasui, Kazuomi; and Terada, Haruko, 3,956,276.

Hata, Toju; Omura, Satoshi; Katagiri, Michiko; Awaya, Juichi; Kuyama, Shimpei; Higashikawa, Shizuo; Yasui, Kazuomi; and Terada, Haruko, 3,956,487.
Terada, Yukio: *See—*
Kawamata, Tadashi; Hirota, Eiichi; and Terada, Yukio, 3,956,151.
Terner, Emanuel M., to Midland Glass Company, Inc. Process for producing glass articles. 3,955,956, Cl. 65-134.000.
Terranova, Richard A.: *See—*
Idaszak, Leo R.; Terranova, Richard A.; and Heady, Robert E., 3,956,065.
Terry, Herbert: *See—*
Schoenholz, Daniel; Petersen, Arthur; and Terry, Herbert, 3,956,197.
Tessera, Giancarlo, to Honeywell Information Systems, Inc. Control unit for a microprogrammed computer with overlapping of the executive and interpretative phase of two subsequent microinstructions. 3,956,738, Cl. 340-172.500.
Texaco Development Corporation: *See—*
Cavitt, Stanley Bruce, 3,956,180.
Texaco Inc.: *See—*
Christopher, Charles A., Jr.; and Satter, Abdus, 3,956,145.
Curtice, Beverly A.; and Harnsberger, Bobby G., 3,955,993.
Franz, William F.; and Cole, Edward L., 3,956,417.
Mott, George E., 3,955,521.
Pogonowski, Ivo C.; and Carmichael, Paul D., 3,955,372.
Rigdon, Orville Wayne; Kuntschik, Lawrence Frank; and Edwards, Robert Sammie, 3,956,389.
Suggitt, Robert M.; Gates, Walter C., Jr.; and Hudson, Ralph B., Jr., 3,956,090.
Walker, Thad O., 3,956,141.
Texas Instruments Incorporated: *See—*
Brantingham, George L.; and Novak, Larry T., 3,956,620.
Gordon, James Sneddon, 3,956,685.
Hite, Larry R., 3,956,643.
LeCocq, Andrew D., 3,955,356.
Marcus, Harris L., 3,956,031.
Texel Industries, Inc.: *See—*
Bounds, Joseph W.; Goldstein, Lynn E.; and Willard, Franklin E., 3,955,528.
Textron, Inc.: *See—*
Myers, John L.; and Singleton, David L., 3,956,573.
Textured Yarn Co.: *See—*
Stanley, Robert K., 3,955,253.
Tezuka, Hiroshi, to Gelan Kabushiki Kaisha. Explosive slurry composition containing sodium montmorillonite. 3,956,040, Cl. 149-41.000.
Thacker, Louis H.: *See—*
Breillatt, Julian P., Jr.; Remenyik, Carl J.; Sartory, Walter K.; Thacker, Louis H.; and Penland, William Z., 3,955,755.
Thackston, Clyde David, to Rockwell International Corporation. Torque limiting wrench. 3,955,662, Cl. 192-150.000.
Theodorides, Vassilios J.: *See—*
Gyurik, Robert J.; and Theodorides, Vassilios J., 3,956,499.
Thielbahr, William H.: *See—*
Stayton, Leroy M.; Thielbahr, William H.; and Connelly, James C., 3,956,453.
Thiery, Edward I.: *See—*
Landsman, Douglas A.; and Thiery, Edward I., 3,956,014.
Thomas, Albert: *See—*
Roman, Joseph M.; and Thomas, Albert, 3,955,897.
Thomas, Charles W., Jr., to Stewart, Burgess F.; and Wilburn, William F. Fuel/air mixing device for internal combustion engine carburetor. 3,955,548, Cl. 123-141.000.
Thomas J. Lipton, Inc.: *See—*
Evans, Mervyn Thomas Arthur; Jones, Malcolm Glyn Desmond; and Jones, Norman, 3,956,519.
Thomas, John C. Electrostatic device and game. 3,955,630, Cl. 273-153.00R.
Thomas, Lawrence M.: *See—*
Marshall, Paul W.; Beaver, Darrell F.; and Thomas, Lawrence M., 3,955,742.
Thompson, Roy Dale. Identification tag and insertion tool for cattle. 3,955,580, Cl. 128-330.000.
Thompson, Tommy Lewis, to Life Support, Inc. Oxygen generator. 3,955,931, Cl. 23-281.000.
Thornburg, David D.; and Johnson, Richard I., to Xerox Corporation. Selective etchants for thin film devices. 3,956,042, Cl. 156-3.000.
Thorsman, Oswald Willy. Fastener with deformable portion for guiding pins or the like. 3,955,462, Cl. 85-10.00R.
Tico, Ramon. Fruit harvesting machine. 3,955,343, Cl. 53-391.000.
Tilg, Robert: *See—*
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Timony, Peter E.: *See—*
Marolewski, Theodore A.; and Timony, Peter E., 3,956,154.
Tine, Sebastian David; Dewberry, Albert W.; and Schommer, Alfred S., to Watts Regulator Company. Adjustable control and lock means therefor, such as for use with an air-operated lubricator. 3,955,647, Cl. 184-56.00R.
Tischbirek, Gunther: *See—*
Krause, Horst-Jurgen; and Tischbirek, Gunther, 3,956,383.
Tixier, Rene. Polysaccharide gels. 3,956,272, Cl. 260-209.00R.
Tizzi, Valtiero. Semimanufactured product for use in jewelry. 3,955,934, Cl. 29-191.000.
T'Jampens, Germain Remi: *See—*
Almer, Friedrich Hermann Raymond; de Ridder, Jan; and T'Jampens, Germain Remi, 3,956,659.
Tkach, Khaim Berkovich: *See—*
Kostylev, Alexandr Dmitrievich; Gurkov, Konstantin Stepanovich; Rozhkov, Leonid Georgievich; Tkach, Khaim Berkovich; Tanov, Evgeny Ivanovich; and Ploschadny, Viktor Yakovlevich, 3,955,631.
Tobacco Research and Development Institute Limited: *See—*
Strydom, Mauritz L., 3,955,406.
Tochon, Jean Paul, to Saint-Gobain Industries. Vitroceramics. 3,955,990, Cl. 106-39.600.
Toda, Takashi: *See—*
Tomita, Kahei; Oshima, Takeo; Toda, Takashi; and Ikemi, Mituo, 3,955,340.
Todd, Donald V., to Koppers Company, Inc. Creosote and a method for producing the same. 3,956,100, Cl. 208-2.000.
Toki, Katsuya: *See—*
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Von Bebenburg, Walter; and Offermanns, Heribert, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of substituted 2-benzoylpyridines. 3,956,344, Cl. 260-297.00R.

von Hofe, George W., to NJM, Inc. Method of printing labels. 3,955,502, Cl. 101-426.000.

von Hofe, George W., to NJM, Inc. Method of printing labels by the offset printing process. 3,955,503, Cl. 101-426.000.

Von Holdt, John W.; and Stelyn, George C., to United Ventures, Inc. Container vibrator mechanism for use in a vending machine. 3,955,718, Cl. 222-197.000.

von Rambach, Leonhard; Daubach, Ewald; and Honigmann, Bertold, to BASF Aktiengesellschaft. β-Modified azo dye. 3,956,270, Cl. 260-205.000.

von Wiesenthal, Peter, to Heat Research Corporation. Heater for large flows at low pressure losses. 3,955,552, Cl. 126-110.00R.

Vora, Bipin V., to Universal Oil Products Company. Alkylation process utilizing HF regenerator stream to a multi-tray isoparaffin stripper. 3,956,416, Cl. 260-683.480.

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Wakabayashi, Takeshi; Takatsuka, Kiyoshi; and Takagi, Akira, to Mitsubishi Jukogyo Kabushiki Kaisha. Method for measuring a driving power by means of an induction motor. 3,955,410, Cl. 73-133.00R.

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Waku, Toshihiko; and Takeuchi, Hiroshi, to Sony Corporation. Variable band pass filter circuit. 3,956,719, Cl. 333-72.000.

Walden, John P., to General Electric Company. DC to AC inverter having improved switching efficiency, overload, and thermal protection features. 3,956,684, Cl. 321-12.000.

Walker, Brooks. Holding bar for a closure. 3,955,841, Cl. 292-259.00R.

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Walker, Thad O., to Texaco Inc. Additive for reducing fluid loss or filtration rate for aqueous drilling fluid containing both high salinity and high soluble calcium. 3,956,141, Cl. 252-8.50A.

Wallace, Gary Leonard, to Chemetron Corporation. Apparatus for accumulating stacks of sliced material. 3,955,689, Cl. 214-6.00H.

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Wasko, Bernard, to Voland Corporation. Precision balance. 3,955,638, Cl. 177-212.000.

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Weathers, Luther V.; Saliga, Thomas V.; Looney, Joseph M.; Harris, Harvey H.; and Gardenhour, Cletus L., to Paradyne Corporation. Data telecommunication system. 3,956,589, Cl. 178-58.00A.

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Weman, Per Olaf, to Sigmatex, A.G. Belt winder for safety belts. 3,955,774, Cl. 242-107.40A.
Wemhoener, Heinrich. Multiple-piston press for synthetic-resin coating of large surface-area workpieces. 3,956,058, Cl. 156-583.000.
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Yaguchi, Mashachika; Jinnai, Toshio; Shirotsuka, Mikio; and Totani, Kazuo, to Dai Nippon Toryo Kabushiki Kaisha. Electro-optical device employing nematic liquid crystal. 3,955,881, Cl. 350-160.0LC.

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Yale, Harry L., to E. R. Squibb & Sons, Inc. Long acting tranquilizing agent. 3,956,493, Cl. 424-247.000.

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Yamamoto, Takaaki; Tanaka, Osamu; Katoh, Hirotada; and Nakashima, Shozaburo, to Nippon Steel Corporation. Annealing separator for heat treatment of silicon steel sheets. 3,956,029, Cl. 148-27.000.

Yamanaka, Akira, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Absorbing safety arrangement for a truck. 3,955,640, Cl. 180-91.000.

Yamanaka, Akira, to Minolta Camera Kabushiki Kaisha. Film sensitivity setting device. 3,956,763, Cl. 354-289.000.

Yamasita, Keniti; and Yamasita, Zyozi. Apparatus for molding layered concrete slabs. 3,955,907, Cl. 425-130.000.

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Yannone, Robert A.; and Shields, James J., to Westinghouse Electric Corporation. Bearing temperature system failure detection apparatus suitable for use in power plants and like apparatus. 3,955,359, Cl. 60-39.28T.

Yasuba, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Method of improving the reusability of an electrophotographic photosensitive plate. 3,956,525, Cl. 427-41.000.

Yasui, Kazuomi: *See—*
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Yates, Robert V., Jr., to Deering Milliken Research Corporation. Tetrahedron forming machine. 3,955,335, Cl. 53-55.000.

Yeda Research & Development Co. Ltd.: *See—*
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Yee, Hugh. Pregnancy test. 3,955,928, Cl. 23-230.00B.

Yellin, Bernard. Means for converting an open-shelved unit or etagere to a closed cabinet with slidable closure panels. 3,955,863, Cl. 312-257.00R.

Yokich, Bernard A. Golf putter. 3,955,819, Cl. 273-164.000.

Yokoyama, Tosiro: *See—*
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Yoshikawa, Toshio; Sakamoto, Nagayoshi; and Nagamori, Tomitada, to Ube Industries, Ltd. N-(Salicyloylamino)imides and process for the preparation of the same. 3,956,331, Cl. 260-281.00N.

Yoshimura, Chozo; and Hirochi, Michiaki, to Kabushiki Kaisha Shokosha. Anodizing bath for composite metal material composed of aluminum or aluminum alloy and different metal having a lower ionization tendency. 3,956,082, Cl. 204-58.000.

Young, David Edward: *See*—
Gould, Douglas Eugene; Young, David Edward; Anderson, Lowell Ray; and Fox, William Burke, 3,956,470.

Young, Eugene F., to Xerox Corporation. Anti-plugging device for automatic developability control systems. 3,956,108, Cl. 209-10.000.

Young, Robert W.; and Graf, Robert E., to American Optical Corporation. Absorptive glass. 3,955,991, Cl. 106-47.00Q.

Young, Walter L.; Douglas, C. J.; Connally, Carl A.; and Cheek, Robert L., to Ozark-Mahoning Company. Multi-stage processing and concentration of solutions. 3,956,061, Cl. 159-48.00L.

Yujiri, Toshio. Feeder with timed batch mixing system. 3,955,537, Cl. 119-51.130.

Yumino, Hiroshi: *See*—
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Zablocki, Richard A.: *See*—
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Zaehring, Gerhard, to Motoren- und Turbinen-Union Munchen GmbH. Locking device for the rotor blades of a flow machine. 3,955,898, Cl. 416-215.000.

Zahir, Abdul-Cader; Remabold, Heinz; and Losert, Ewald, to Ciba-Geigy Corporation. Process for the manufacture of printed multilayer circuits. 3,956,043, Cl. 156-3.000.

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Zajacek, John G.; McCoy, John J.; and Fuger, Karl E., to Atlantic Richfield Company. Process for the manufacture of urethanes. 3,956,360, Cl. 260-471.00C.

Zakrzewski, Robert, to Outboard Marine Corporation. Extension handle assembly. 3,955,438, Cl. 74-480.00B.

Zambre, Bhagvantrao G., to Elma Engineering. Integral cycle, precise zero voltage switch. 3,956,644, Cl. 307-252.0UA.

Zaruba, Jiri; Fruehauf, Josef; Mikulik, Jan; and Vodenka, Bohumil, to Stredisko pro vynalezy a zlepsovaci navrhy. Apparatus for filling and discharging tower-shaped storage spaces. 3,955,691, Cl. 214-17.0CB.

Zearfoss, Elmer W., Jr. Refrigeration apparatus and method. 3,955,374, Cl. 62-197.000.

Zebarth, Ralph S. Collapsible shipping container. 3,955,703, Cl. 220-6.000.

Zelaskowski, Catherine A.; and Carlisi, John J., to Mobil Oil Corporation. Trace lead analysis method. 3,955,927, Cl. 23-230.00R.

Zenith Radio Corporation: *See*—
Lange, Howard G., 3,955,980.
Stachniak, Raymond M., 3,955,981.
Tanaka, Akio, 3,956,702.

Zickos, William T. Drum construction. 3,955,465, Cl. 84-411.00R.

Ziemba, Richard T., to General Electric Company. Proximity fuse. 3,955,507, Cl. 102-70.20P.

Zimmerman, Carle C., Jr.: *See*—
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Zuech, Ernest A., to Phillips Petroleum Company. Rhodium hydroformylation catalyst. 3,956,177, Cl. 252-428.000.

Zuech, Ernest A., to Phillips Petroleum Company. Catalysts for production of cycloalkylaromatics. 3,956,183, Cl. 252-441.000.

Zuercher, Klaus Paul Ernest: *See*—
Goerling, Paul Martin; and Zuercher, Klaus Paul Ernest, 3,955,489.

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Zukel, John W.: *See*—
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Zupan, Norbert M., to H-C Industries, Inc. Apparatus and method for supplying a metered charge at any feed rate. 3,955,605, Cl. 141-1.00R.

Zutrauen, Stephen W.; and Stauskas, Peter P., to Garrett Corporation, The. Method and apparatus for testing magnetic sensors using a saturable core and variable load resistors to simulate actual test conditions. 3,956,693, Cl. 324-34.00R.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 11TH DAY OF MAY, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

American Cyanamid Company: *See*—
Panzer, Hans Peter; and Dixon, Kenneth Wayne, Re. 28,807.
Panzer, Hans Peter; and Dixon, Kenneth Wayne, Re. 28,808.
Bell Telephone Laboratories, Incorporated: *See*—
Pierce, John Robinson, Re. 28,811.
Braid, Milton, to Mobil Oil Corporation. Lubricants containing amine antioxidants. Re. 28,805, Cl. 252-50.000.
Dixon, Kenneth Wayne: *See*—
Panzer, Hans Peter; and Dixon, Kenneth Wayne, Re. 28,807.
Panzer, Hans Peter; and Dixon, Kenneth Wayne, Re. 28,808.
Fuji Oil Co., Ltd.: *See*—
Tsumura, Haruo; Hashimoto, Yukio; and Kubota, Hayata, Re. 28,810.
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Tsumura, Haruo; Hashimoto, Yukio; and Kubota, Hayata, Re. 28,810.
Mobil Oil Corporation: *See*—
Braid, Milton, Re. 28,805.
National Starch and Chemical Corporation: *See*—
Tessler, Martin M., Re. 28,809.
Panzer, Hans Peter; and Dixon, Kenneth Wayne, to American Cyanamid Company. Polyquaternary flocculants. Re. 28,807, Cl. 260-2.0BP.
Panzer, Hans Peter; and Dixon, Kenneth Wayne, to American Cyanamid Company. Polyquaternary flocculants. Re. 28,808, Cl. 260-2.0BP.
Pierce, John Robinson, to Bell Telephone Laboratories, Incorporated. Interconnected loop data block transmission system. Re. 28,811, Cl. 179-15.0AL.
Saeva, Franklin D.; and Schank, Richard L., to Xerox Corporation. Liquid crystal compositions. Re. 28,806, Cl. 252-299.000.
Schank, Richard L.: *See*—
Saeva, Franklin D.; and Schank, Richard L., Re. 28,806.
Tessler, Martin M., to National Starch and Chemical Corporation. Preparation of starch esters. Re. 28,809, Cl. 260-233.500.
Tsumura, Haruo; Hashimoto, Yukio; and Kubota, Hayata, to Fuji Oil Co., Ltd. Preparation of soy cheese. Re. 28,810, Cl. 426-46.000.
Xerox Corporation: *See*—
Saeva, Franklin D.; and Schank, Richard L., Re. 28,806.

LIST OF PLANT PATENTEES

Cooper, Calvin L., to Stark Brothers Nurseries & Orchard Co. Apple tree-starkspur prime red. 3,822, 5–11–76, Cl. 35.
Hines, James W., Jr., to Hines Wholesale Nurseries, Azalea plant. 3,881, 5–11–76, Cl. 57.
Hines Wholesale Nurseries: *See*—
Hines, James W., Jr. 3,881.
Lammerts, Walter E. 3,885.
Lammerts, Walter E., to Hines Wholesale Nurseries, Lilac plant. 3,885, 5–11–76, Cl. 66.
Owen, R. J. Pomegranate tree. 3,883, 5–11–76, Cl. 33.
Owen, R. J. Pomegranate tree. 3,884, 5–11–76, Cl. 33.
Stark Brothers Nurseries & Orchards Co.: *See*—
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Alessandri, Marc. Typist chair. 239,791, 5–11–76, Cl. D6—30.
Alessandri, Marc. Arm chair. 239,792, 5–11–76, Cl. D6—31.
Allaway, Jeanne M. Arm garment. 239,788, 5–11–76, Cl. D2—452.
Allibert Exploitation Societe: *See*—
Vrignaud, Guy. 239,798.
Armstrong, William J., to General Electric Co. Container for eggs or the like. 239,875, 5–11–76, Cl. D67—3.
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Avery, Frederick M., to The Howard Co., Inc. Transparency display module. 239,874, 5–11–76, Cl. D61—1.
Baumrind, Stephen, 50% to Larry H. Kline. Combined splash-guard and holder for bathroom accessories. 239,831, 5–11–76, Cl. D23—69.
Beaver, Theodore L.: *See*—
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Bedient, Jack R. Water scooter. 239,851, 5–11–76, Cl. D34—42.
Bernard, Charles, to Airborne S.A. Seat. 239,795, 5–11–76, Cl. D6—71.
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Borg-Warner Corp.: *See*—
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Bradford, George A. Brush press. 239,813, 5–11–76, Cl. D8—71.
Bressickello, Tony J. Combined display rack and merchandise holders. 239,806, 5–11–76, Cl. D6—188.
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Chase, Ascher, to General Foam Plastics Corp. Pool with dual integrally molded slides. 239,844, 5–11–76, Cl. D34—5.
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Cooper, Howard. Retail food market. 239,828, 5–11–76, Cl. D13—1.
Crimmins, James W., to Data Transmission Sciences Inc. Speaker telephone. 239,838, 5–11–76, Cl. D26—14.
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Fentules, Charles S. Combined support and container for toothbrush. 239,799, 5–11–76, Cl. D6—94.
Findelsen, John L. Golf club carrier. 239,847, 5–11–76, Cl. D34—3.
Frederick, William N. Trophy. 239,839, 5–11–76, Cl. D29—28.
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Gould, Calvin. Charcoal briquette seive. 239,812, 5–11–76, Cl. D7—206.
Goy, Manuel. Timer. 239,819, 5–11–76, Cl. D10—40.
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Komendowski, Henry, to Inhalation Therapy Equipment, Inc. Nebulizer-humidifier container for inhalation therapy. 239,880, 5–11–76, Cl. D83—1.
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Kremer, Alan K., to Meyer Materials, Inc. Motorcycle fairing. 239,825, 5–11–76, Cl. D12—182.
Kronewitter, Margaret M. Macrame bracelet. 239,854, 5–11–76, Cl. D45—4.
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Levesque, Yvon G., and G. D. Russell, to Johnson & Johnson. Apertured nonwoven fabric. 239,871, 5–11–76, Cl. D59—1.
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Mouwen, Herman C., and F. M. Servas, to Johnson & Johnson. Blood filtration unit. 239,878, 5–11–76, Cl. D83—1.
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Pinsler, Jerome L., and Anson Isaacson, to Marvin Glass & Associates. Combined bicycle radio and light. 239,868, 5–11–76, Cl. D56—4.
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202 3,956,131
219 3,956,132
232 3,956,133
275 3,956,134
377 3,956,135
500M 3,956,136
532S 3,956,137
CLASS 211
13 3,955,681
74 3,955,682
3,955,683
CLASS 212
48 3,955,684
CLASS 214
1H 3,955,685
1Q 3,955,686
1.5 3,955,687
6F 3,955,688
6H 3,955,689
10.5D 3,955,690
17CB 3,955,691
17R 3,955,851
18N 3,955,692
35R 3,955,693
82 3,955,694
140 3,955,695
CLASS 215
1C 3,955,697
11E 3,955,698
214 3,955,696
246 3,955,699
CLASS 219
10.55D 3,956,608
69P 3,956,609
137PS 3,956,610
349 3,956,611
358 3,956,612
436 3,956,613
541 3,956,614
CLASS 220
1.5 3,955,700
3.7 3,955,701
4F 3,955,702
6 3,955,703
21 3,955,704
67 3,955,705
87 3,955,706
243 3,955,707
269 3,955,708
335 3,955,709
367 3,955,710
CLASS 221
73 3,955,711
CLASS 222
80 3,955,712
129.4 3,955,713
132 3,955,714
143 3,955,715
153 3,955,716
195 3,955,717
197 3,955,718
386 3,955,719
396 3,955,720
566 3,955,721
CLASS 223
106 3,955,722
CLASS 224
2B 3,955,724
5R 3,955,725
3,955,726
31 3,955,727
3,955,728
36 3,955,729
3,955,730
42.1E 3,955,731
3,955,732
45K 3,955,733
58 3,955,734
CLASS 225
103 3,955,735
CLASS 226
6 3,955,736
108 3,955,737
140 3,955,738
CLASS 227
1 3,955,739
CLASS 228
3,955,740
2.5 3,955,741
CLASS 229
1.5C 3,955,742
14BE 3,955,743
28R 3,955,744
30 3,955,745
37E 3,955,746
3,955,747
44R 3,955,748
61 3,955,749
69 3,955,750
73 3,955,751
84 3,955,752
CLASS 233
1C 3,955,753
2 3,955,754
3 3,955,755
7 3,955,756
19R 3,955,757
20R 3,955,758
CLASS 235
61.7B 3,956,615
92CC 3,956,616
151.1 3,956,617
151.3 3,956,618
156 3,956,619
3,956,620
164 3,956,621
3,956,622
186 3,956,623
194 3,956,624
CLASS 236
12R 3,955,759
86 3,955,760
CLASS 238
8 3,955,761
CLASS 239
119 3,955,763
206 3,955,764
230 3,955,762
CLASS 240
1.3 3,956,625
CLASS 241
28 3,955,765
56 3,955,766
275 3,955,767
CLASS 242
18PW 3,955,768
47.01 3,955,769
68.4 3,955,770
71.2 3,955,771
78.7 3,955,772
81 3,955,773
107.4A 3,955,774
125.1 3,955,775
191 3,955,776
192 3,955,777
194 3,955,778
199 3,955,779
CLASS 244
12B 3,955,780
13 3,955,781
53R 3,955,782
85 3,955,783
172 3,955,784
CLASS 246
34CT 3,955,785
CLASS 248
159 3,955,787
228 3,955,788
311A 3,955,789
489 3,955,790
537 3,955,786
CLASS 250
199 3,956,626
205 3,956,628
209 3,956,627
223R 3,956,629
3,956,632
302 3,956,630
321 3,956,631
362 3,956,633
396R 3,956,634
492A 3,956,635
572 3,956,636
CLASS 251
11 3,955,791
69 3,955,792
95 3,955,793
123 3,955,794
129 3,955,795
172 3,955,796
CLASS 252
3 3,956,138
8.1 3,956,139
8.5A 3,956,141
8.5C 3,956,140
3,956,142
8.55D 3,956,145
8.8 3,956,143
3,956,144
12 3,956,146
47.5 3,956,148
50 Re.28,805
51.5A 3,956,149
62.51 3,956,151
3,956,152
62.9 3,956,150
67 3,956,153
78 3,956,154
91 3,956,155
95 3,956,156
3,956,157
102 3,956,158
104 3,956,159
132 3,956,160
156 3,956,161
162 3,956,162
171 3,956,163
180 3,956,164
182 3,956,165
3,956,166
299 Re.28,806
3,956,167
3,956,168
3,956,169
301.4R 3,956,170
313S 3,956,171
316 3,956,172
3,956,173
400R 3,956,174
412 3,956,175
426 3,956,176
428 3,956,177
429B 3,956,178
430 3,956,179
431R 3,956,180
432 3,956,181
435 3,956,182
441 3,956,183
443 3,956,184
455R 3,956,185
3,956,186
457 3,956,187
465 3,956,188
466A 3,956,190
466J 3,956,189
474 3,956,191
477R 3,956,192
500 3,956,193
507 3,956,194
511 3,956,195
522 3,956,196
526 3,956,197
542 3,956,198
545 3,956,199
CLASS 254
89H 3,955,797
139 3,955,798
CLASS 256
21 3,955,799
59 3,955,800
65 3,955,801
CLASS 259
117 3,955,802
CLASS 260
2BP Re.28,807
Re.28,808
2.5AK 3,956,202
2.5AR 3,956,200
2.5B 3,956,203
2.5M 3,956,201
7 3,956,204
3,956,205
17R 3,956,206
17.5 3,956,207
18PN 3,956,208
18S 3,956,209
21 3,956,210
22CA 3,956,211
23H 3,956,212
3,956,214
23R 3,956,213
29.4R 3,956,215
29.7NR 3,956,217
29.7D 3,956,218
29.7H 3,956,216

30.2 3,956,219
31.6 3,956,220
3,956,221
32.6R 3,956,222
33.6AQ 3,956,223
33.6UA 3,956,225
33.6R 3,956,224
37EP 3,956,226
38 3,956,227
40R 3,956,228
3,956,229
42.14 3,956,230
3,956,231
42.32 3,956,232
45.7R 3,956,233
45.75C 3,956,235
45.85T 3,956,236
45.9R 3,956,234
47EC 3,956,241
47EN 3,956,237
3,956,239
47ET 3,956,242
47C 3,956,240
47R 3,956,238
67.6R 3,956,243
112B 3,956,259
112R 3,956,113
3,956,258
112.5T 3,956,260
124A 3,956,261
140R 3,956,262
146R 3,956,263
155 3,956,264
156 3,956,265
157 3,956,266
165 3,956,267
187 3,956,268
192 3,956,269
205 3,956,270
208 3,956,271
209R 3,956,272
3,956,273
210AB 3,956,274
210S 3,956,275
211R 3,956,276
211.5R 3,956,277
233.5 Re.28,809
234R 3,956,278
239.1 3,956,279
239.65 3,956,280
240B 3,956,283
240G 3,956,281
3,956,282
240R 3,956,284
243A 3,956,289
243B 3,956,285
243C 3,956,286
3,956,287
3,956,288
3,956,290
3,956,291
3,956,292
246B 3,956,293
3,956,294
247.2A 3,956,296
247.5EP 3,956,297
247.5FP 3,956,295
248NS 3,956,298
248A 3,956,299
249.5 3,956,300
251R 3,956,301
256.4C 3,956,302
3,956,325
256.4N 3,956,327
256.5R 3,956,326
268BC 3,956,328
3,956,330
268SY 3,956,329
281N 3,956,331
282 3,956,332
283CN 3,956,333
293.5A 3,956,336
293.6A 3,956,334
293.7 3,956,335
293.8B 3,956,337
294.9 3,956,338
295R 3,956,339
295.5R 3,956,340
3,956,341
296R 3,956,342
3,956,343
297R 3,956,344
306.8R 3,956,303
307A 3,956,304
307F 3,956,305
308R 3,956,306
309.2 3,956,307
309.5 3,956,308
3,956,309
309.7 3,956,310
310A 3,956,311
310C 3,956,312
326.5FL 3,956,314
326.5S 3,956,313
332.2A 3,956,315
340.5 3,956,316
340.7 3,956,317
346.1R 3,956,318
3,956,319
346.3 3,956,320
3,956,321
3,956,322
347.5 3,956,323
368 3,956,324
380 3,956,345
396R 3,956,346
397.1 3,956,347
397.45 3,956,349
397.5 3,956,348
404.5 3,956,350
419 3,956,351
448AD 3,956,352
448.8R 3,956,353
456A 3,956,354
464 3,956,355
465.2 3,956,356
465.4 3,956,357
465.8D 3,956,358
470 3,956,359
471C 3,956,360
473S 3,956,361
475R 3,956,362
479C 3,956,364
479R 3,956,363
482C 3,956,365
3,956,366
482R 3,956,367
501.14 3,956,368
501.15 3,956,369
502.5 3,956,370
503 3,956,371
505S 3,956,372
515A 3,956,373
3,956,374
520C 3,956,375
530N 3,956,376
3,956,377
533N 3,956,378
534E 3,956,379
535P 3,956,380
3,956,381
3,956,382
3,956,383
545R 3,956,384
556A 3,956,385
557R 3,956,386
561N 3,956,387
562R 3,956,388
563D 3,956,389
570.6 3,956,390
570.9 3,956,391
586R 3,956,392
598 3,956,393
599 3,956,394
607A 3,956,395
610A 3,956,397
610R 3,956,398
610 3,956,396
612R 3,956,399
614R 3,956,400
615B 3,956,401
619B 3,956,402
620 3,956,403
631.5 3,956,404
633 3,956,405
637P 3,956,406
638R 3,956,407
3,956,408
645 3,956,409
647 3,956,410
648R 3,956,411
653.1T 3,956,412
668A 3,956,413
683R 3,956,414
3,956,415
683.48 3,956,416
683.63 3,956,417
3,956,418
827 3,956,419
3,956,420
862 3,956,421
873 3,956,422
874 3,956,423
876R 3,956,424
878R 3,956,245
3,956,425
879 3,956,426
923 3,956,427
929 3,956,428
938 3,956,429
949 3,956,430
971 3,956,431

CLASS 261

30 3,956,432
39B 3,956,433
3,956,434
111 3,956,435

CLASS 264

14 3,956,076
29 3,956,436
40 3,956,437
45.5 3,956,451
46.1 3,956,438
46.6 3,956,439
56 3,956,440
89 3,956,441
3,956,452
95 3,956,442
100 3,956,443
109 3,956,444
117 3,956,445
3,956,446
135 3,956,447
138 3,956,448
139 3,956,449
210R 3,956,450
219 3,956,453

CLASS 266

50 3,955,804
158 3,955,803
228 3,955,805
275 3,955,806

CLASS 267

65B 3,955,807
152 3,955,808
156 3,955,809

CLASS 269

238 3,955,810

CLASS 271

9 3,955,811
64 3,955,812
174 3,955,813

CLASS 273

1B 3,955,815
1R 3,955,814
26B 3,955,816
106D 3,955,817
134AC 3,955,818
153R 3,955,630
164 3,955,819
167F 3,955,820
187B 3,955,821

CLASS 277

2 3,955,822
163 3,955,823

CLASS 279

1R 3,955,824

CLASS 280

35 3,955,826
166 3,955,827
279 3,955,828
301 3,955,829
414B 3,955,830
423R 3,955,831
476R 3,955,832
618 3,955,825

CLASS 285

3 3,955,833
110 3,955,834
175 3,955,835
208 3,955,836

CLASS 290

40R 3,956,637

CLASS 292

173 3,955,837
179 3,955,838
226 3,955,839
229 3,955,840
259R 3,955,841
307R 3,955,842

CLASS 294

64R 3,955,843
67R 3,955,844

CLASS 296

10 3,955,845
65R 3,955,846
3,955,847
137B 3,955,848

CLASS 297

183 3,955,849
440 3,955,850

CLASS 301

108R 3,955,852

CLASS 302

17 3,955,853

CLASS 303

21BE 3,955,854

CLASS 305

38 3,955,855

CLASS 307

48 3,956,638
94 3,956,639
205 3,956,640
215 3,956,641
228 3,956,642
229 3,956,643
252UA 3,956,644
264 3,956,645
297 3,956,661

CLASS 308

3R 3,955,856
6C 3,955,857
10 3,955,858
36.1 3,955,859
134.1 3,955,860
189R 3,955,861
235 3,955,862

CLASS 310

9.5 3,956,646
3,956,647
40R 3,956,648
111 3,956,649
156 3,956,650
218 3,956,651

CLASS 312

257R 3,955,863
258 3,955,864
319 3,955,865

CLASS 313

19 3,956,652
60 3,956,653
61D 3,956,654
112 3,956,655
181 3,956,656
214 3,956,657
217 3,956,658
222 3,956,659
3,956,660
398 3,956,662
486 3,956,663

CLASS 315

58 3,956,664
95 3,956,665
111.8 3,956,666
169TV 3,956,667
370 3,956,668
411 3,956,669

CLASS 316

20 3,955,866

CLASS 317

36TD 3,956,670
43 3,956,671
99 3,956,672
100 3,956,673
114 3,956,674
120 3,956,675
230 3,956,676
260 3,956,677

CLASS 318

138 3,956,678
171 3,956,679
578 3,956,680
640 3,956,681
3,956,682

CLASS 320

23 3,956,683

CLASS 321

12 3,956,684
60 3,956,685

CLASS 322

2R 3,956,686

CLASS 323

8 3,956,687
24 3,956,688
44F 3,956,690

CLASS 324

15 3,956,691
165 3,956,689
29.5 3,956,720
34R 3,956,692
3,956,693
38 3,956,694
38.5A 3,956,695
62 3,956,696
133 3,956,697
158R 3,956,698

CLASS 325

15 3,956,699
38B 3,956,700
352 3,956,701
459 3,956,702

CLASS 328

14 3,956,703
61 3,956,704
133 3,956,705
140 3,956,706

CLASS 330

10 3,956,707
30D 3,956,708
124R 3,956,709

CLASS 331

1A 3,956,710
94.5PE 3,956,711
3,956,712
113R 3,956,713
116R 3,956,714

CLASS 332

1 3,956,715
12 3,956,716

CLASS 333

11 3,956,717
30R 3,956,718
72 3,956,719

CLASS 335

6 3,956,721
103 3,956,722
201 3,956,723
216 3,956,724

CLASS 337

407 3,956,725
414 3,956,726

CLASS 338

325 3,956,727

CLASS 339

17CF 3,955,867
18B 3,955,868
32R 3,955,869
39 3,955,870
92R 3,955,871
93L 3,955,872
99R 3,955,873
111 3,955,874
176MP 3,955,875
176L 3,955,876
258P 3,955,877

CLASS 340

3D 3,956,728
5D 3,956,729
15.5CP 3,956,730
27R 3,956,731
64 3,956,732
79 3,956,733
146.3SY 3,956,734
172.5 3,956,735
3,956,736
3,956,737
3,956,738
3,956,739
3,956,740
199 3,956,741
224 3,956,742
244C 3,956,760
258C 3,956,743
324R 3,956,744
337 3,956,745
347AD 3,956,746

CLASS 343

6R 3,956,747
7A 3,956,748
16R 3,956,749
712 3,956,750
744 3,956,751
754 3,956,752

CLASS 346

34 3,956,753
74ES 3,956,755
74E 3,956,754
75 3,956,756

CLASS 350

96R 3,955,878
160LC 3,955,881
160R 3,955,879
3,955,880
164 3,955,882
215 3,955,883
248 3,955,884

CLASS 351

155 3,955,885

CLASS 352

137 3,955,886
166 3,955,887

CLASS 354

3,956,757
53 3,956,758
150 3,956,759
255 3,956,761
289 3,956,762
3,956,763
298 3,956,764

CLASS 355

1 3,955,888
3R 3,955,889

CLASS 356

39 3,955,890
74 3,955,891
219 3,955,892

CLASS 357

30 3,956,765

CLASS 360

22 3,956,767
77 3,956,769
78 3,956,766
92 3,956,768
103 3,956,770
127 3,956,771

CLASS 401

106 3,955,893
259 3,955,894

CLASS 403

340 3,955,895

CLASS 408

1R 3,955,896
186 3,955,897

CLASS 416

215 3,955,898

CLASS 417

269 3,955,899
361 3,955,900
395 3,955,901
477 3,955,902

CLASS 418

61B 3,955,903
121 3,955,904
182 3,955,905

CLASS 423

19 3,956,147
136 3,956,454
3,956,455
171 3,956,456
206T 3,956,457
210 3,956,458
213.5 3,956,459
221 3,956,460
263 3,956,461
299 3,956,462
300 3,956,463
308 3,956,464
321S 3,956,465
325 3,956,466
332 3,956,467
365 3,956,468
387 3,956,469
466 3,956,470
474 3,956,471
497 3,956,472
573R 3,956,473
593 3,956,474
604 3,956,475

CLASS 424

4 3,956,476
8 3,956,477
52 3,956,478
54 3,956,479
3,956,480
92 3,956,481
93 3,956,482
94 3,956,483
177 3,956,484
181 3,956,487
195 3,956,485
200 3,956,486
232 3,956,488
233 3,956,489
3,956,490
241 3,956,491
244 3,956,492
247 3,956,493
248 3,956,494
251 3,956,495
3,956,496
- 3,956,497
270 3,956,498
273 3,956,499
276 3,956,500
282 3,956,501
304 3,956,502
305 3,956,503
319 3,956,504
327 3,956,505

CLASS 425

88 3,955,906
130 3,955,907
390 3,955,908

CLASS 426

28 3,956,506
46 Re.28,810
96 3,956,507
106 3,956,508
3,956,509
3,956,510
3,956,511
140 3,956,512
271 3,956,513
276 3,956,514
302 3,956,515
420 3,956,516
502 3,956,517
518 3,956,518
564 3,956,519
582 3,956,520
588 3,956,521
603 3,956,522

CLASS 427

24 3,956,523
40 3,956,524
41 3,956,525
73 3,956,526
84 3,956,527
125 3,956,528
171 3,956,529
193 3,956,530
226 3,956,531
3,956,532
236 3,956,533
243 3,956,534
305 3,956,535

328	3,956,536	37	3,956,545	131	3,956,556	379	3,956,567	344	3,955,913	73	3,956,251
343	3,956,538	43	3,956,546	167	3,956,557	408	3,956,568	353	3,955,914	74	3,956,252
358	3,956,539		3,956,547	204	3,956,558	412	3,956,569	CLASS 432		79	3,956,244
430	3,956,540	64	3,956,548	214	3,956,559	446	3,956,570	17	3,955,915	194	3,956,250
433	3,956,537	71	3,956,549	218	3,956,560	513	3,956,571	60	3,955,916	219	3,956,248
CLASS 428		81	3,956,550	288	3,956,561			106	3,955,917	338	3,956,246
		88	3,956,551	323	3,956,562	CLASS 431		CLASS 526		352	3,956,253
2	3,956,541		3,956,552	327	3,956,563	10	3,955,909				3,956,254
35	3,956,542	90	3,956,553	366	3,956,564	25	3,955,910	42	3,956,247		3,956,255
36	3,956,543	95	3,956,554	375	3,956,566	93	3,955,911	64	3,956,256	CLASS 528	
	3,956,544	106	3,956,555	378	3,956,565	95R	3,955,912		3,956,257	500	3,956,249

CLASSIFICATION OF DESIGNS

D2—	259	239,787		168	239,804		69	239,821		14A	239,838	D45—	4C	239,854			239,870
	452	239,788		187	239,805	D12—	91	239,822	D29—	23	239,840	D47—	6E	239,855	D59—	1	239,871
D6—	16	239,789		188	239,806		96	239,823			239,841			239,856	D61—	J	239,874
	22	239,790		211	239,807		110	239,824			239,842			239,857		N	239,873
	30	239,791		246	239,808		182	239,825		28B	239,839	D48—	4B	239,858		Q	239,872
	31	239,792	D7—	27	239,809	D13—	1R	239,828	D34—	3	239,843		24A	239,859	D67—	3B	239,875
	42	239,793		167	239,810		.5	239,827		4R	239,846		31	239,860	D77—	1R	239,876
	49	239,794		170	239,811		.6	239,826		5GB	239,847			239,861	D83—	F	239,877
	71	239,795		206	239,812	D22—	19	239,829		SS	239,848	D55—	1B	239,864			239,878
	85	239,796	D8—	71	239,813	D23—	1	239,830		F	239,844		C	239,863			239,881
		239,797		138	239,814		69	239,831			239,845		R	239,862		N	239,879
		239,798		229	239,815	D26—	1D	239,832		K	239,849	D56—	4B	239,865			239,880
	94	239,799	D9—	105	239,816			239,834		15B	239,850			239,866	D86—	10F	239,883
	146	239,800		183	239,817		R	239,833		42	239,851			239,867			239,884
	161	239,801		254	239,818		5C	239,835	D35—	1	239,852			239,868			239,885
		239,802	D10—	40	239,819			239,836		3R	239,853			239,869	D87—	5R	239,882
	164	239,803		46	239,820		6	239,837									

CLASSIFICATION OF PLANTS

P. —	33	3,883	P. —		3,884	P. —	35	3,882	P. —	57	3,881	P. —	66	3,885			

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3,956,724	3,955,599	3,956,318	3,955,709	3,955,817	3,955,682
1 : 3,955,685	3,955,600	3,956,338	3,955,713	3,955,832	3,955,683
3,955,734	3,955,610	3,956,349	3,955,727	3,955,931	3,955,689
3,955,765	3,955,622	3,956,364	3,955,729	3,955,948	3,955,718
3,956,116	3,955,626	3,956,430	3,955,730	3,956,034	3,955,747
3,956,639	3,955,650	3,956,453	3,955,739	3,956,138	3,955,779
4 : 3,955,346	3,955,671	3,956,460	3,955,740	3,956,161	3,955,797
3,955,536	3,955,672	3,956,466	3,955,859	3,956,589	3,955,814
3,955,601	3,955,715	3,956,486	3,955,884	3,956,601	3,955,818
3,955,609	3,955,723	3,956,505	3,955,976	3,956,631	3,955,855
3,955,658	3,955,724	3,956,543	3,955,991	3,956,752	3,955,863
3,956,033	3,955,726	3,956,567	3,955,994	13 : 3,955,402	3,955,947
3,956,591	3,955,731	3,956,600	3,956,014	3,955,515	3,955,949
3,956,708	3,955,762	3,956,615	3,956,027	3,955,632	3,955,953
5 : 3,955,690	3,955,777	3,956,622	3,956,044	3,955,645	3,955,980
6 : Re.28,811	3,955,784	3,956,623	3,956,070	3,955,745	3,955,981
3,955,239	3,955,787	3,956,632	3,956,072	3,955,748	3,956,053
3,955,264	3,955,841	3,956,638	3,956,076	3,955,830	3,956,065
3,955,267	3,955,873	3,956,644	3,956,094	3,956,130	3,956,066
3,955,268	3,955,878	3,956,665	3,956,122	3,956,214	3,956,100
3,955,271	3,955,885	3,956,673	3,956,139	3,956,551	3,956,104
3,955,282	3,955,891	3,956,681	3,956,247	3,956,731	3,956,105
3,955,290	3,955,896	3,956,687	3,956,284	15 : 3,955,294	3,956,109
3,955,304	3,955,914	3,956,690	3,956,359	16 : 3,956,485	3,956,117
3,955,305	3,955,930	3,956,692	3,956,401	3,956,555	3,956,187
3,955,310	3,955,933	3,956,695	3,956,443	17 : 3,955,238	3,956,223
3,955,318	3,955,941	3,956,706	3,956,459	3,955,252	3,956,235
3,955,321	3,955,992	3,956,712	3,956,507	3,955,260	3,956,372
3,955,328	3,956,012	3,956,742	3,956,540	3,955,278	3,956,373
3,955,365	3,956,015	3,956,743	3,956,588	3,955,306	3,956,413
3,955,369	3,956,030	3,956,749	3,956,726	3,955,330	3,956,416
3,955,397	3,956,031	3,956,750	10 : 3,955,227	3,955,342	3,956,418
3,955,413	3,956,042	8 : 3,955,218	3,955,255	3,955,344	3,956,483
3,955,414	3,956,055	3,955,235	3,956,162	3,955,348	3,956,502
3,955,420	3,956,059	3,955,236	3,956,171	3,955,366	3,956,512
3,955,426	3,956,069	3,955,811	3,956,173	3,955,390	3,956,515
3,955,428	3,956,088	3,955,813	3,956,303	3,955,396	3,956,529
3,955,443	3,956,093	3,955,831	3,956,362	3,955,400	3,956,537
3,955,467	3,956,096	3,956,531	3,956,398	3,955,449	3,956,538
3,955,471	3,956,118	3,956,595	3,956,461	3,955,479	3,956,539
3,955,482	3,956,124	3,956,616	12 : 3,955,360	3,955,491	3,956,544
3,955,498	3,956,137	3,956,629	3,955,412	3,955,501	3,956,606
3,955,513	3,956,167	3,956,666	3,955,483	3,955,511	3,956,614
3,955,537	3,956,174	3,956,736	3,955,554	3,955,556	3,956,617
3,955,542	3,956,198	9 : Re.28,807	3,955,562	3,955,572	3,956,651
3,955,566	3,956,240	Re.28,808	3,955,596	3,955,595	3,956,653
3,955,568	3,956,241	3,955,377	3,955,648	3,955,611	3,956,669
3,955,570	3,956,259	3,955,405	3,955,681	3,955,613	3,956,672
3,955,574	3,956,305	3,955,458	3,955,700	3,955,643	3,956,677
3,955,580	3,956,308	3,955,466	3,955,720	3,955,646	3,956,691
3,955,587	3,956,315	3,955,581	3,955,801	3,955,679	3,956,702

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3,956,458	3,955,656	3,956,077	3,955,673	3,955,441	3,955,909
50 : 3,955,300	3,955,706	3,956,296	3,956,062	3,955,526	3,956,498
3,955,507	3,955,722	3,956,463	3,956,063	3,955,527	3,956,518
51 : 3,955,372	3,955,753	3,956,628	3,956,207	3,955,535	3,956,613
3,955,375	3,955,757	3,956,748	54 : 3,956,500	3,955,608	3,956,658
3,955,445	3,955,993	53 : 3,955,389	3,956,573	3,955,684	3,956,721
3,955,497	3,956,050	3,955,488	55 : 3,955,438	3,955,904	56 : 3,956,602

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4 : 239,810	239,878	239,865	239,848	239,872	45 : 239,831
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5 : 239,829	9 : 239,826	239,869	239,862	239,882	239,841
6 : 239,806	239,838	239,870	239,863	37 : 239,794	239,842
239,807	239,883	239,879	27 : 239,853	239,800	239,859
239,813	17 : 239,788	239,880	29 : 239,805	239,803	51 : 239,844
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6 : 3,881	3,883	3,884	3,885	53 : 3,882	

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U.S. DEPARTMENT OF COMMERCE

Elliot L. Richardson, Secretary

PATENT AND TRADEMARK OFFICE

C. Marshall Dann, Commissioner